



## FEDERAL SUBSIDIARY LEGISLATION

**FACTORIES AND MACHINERY ACT 1967 [ACT 139]  
P.U. (A) 113/1983  
FACTORIES AND MACHINERY (FENCING OF MACHINERY AND SAFETY) REGULATIONS 1970  
(REVISED - 1983)  
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## INTRODUCTORY

### 1. Citation.

These Regulations may be cited as the **Factories and Machinery (Fencing of Machinery and Safety) Regulations, 1970.**

### 2. Interpretation.

In these Regulations the terms used shall, unless the context otherwise requires, have the same meanings as are respectively assigned to them by Part I of the Factories and Machinery Act, 1967, referred to in these Regulations as "the Act".

### 3. Guard and guard rail.

For the purpose of these Regulations every guard and guard rail shall conform as far as practicable to specifications in the First and Second Schedules to these Regulations respectively.

## PART I GENERAL CONDITIONS

### 4. Fencing of machinery.

(1) Every dangerous part of every driven machine, prime mover and transmission machinery shall be securely fenced in accordance with these Regulations:

Provided that where the Chief Inspector is satisfied that there is available and suitable for use in connection with machinery any type or description of safety device, he may direct such type or description of device shall be provided for use in connection with such machinery.

(2) Where the Chief Inspector is satisfied that owing to special circumstances the compliance with any of these Regulations is unnecessary or impracticable he may by certificate in writing, which he may in his discretion revoke, exempt the whole or any part of any machinery from the provisions of such regulation.

### 5. Provisions as to unfenced machinery.

(1) Subject to paragraph (2) in determining for the purposes of section 15 of the Act whether any part of machinery is in such a position or of such construction as to be safe to every person employed or working on or entering into the premises as it would be if securely fenced-

(a) no account shall be taken of any person carrying out while the part of machinery is in motion, an examination thereof or any lubrication or adjustment shown by the examination to be immediately necessary if the examination, lubrication or adjustment can only be carried out while the part of machinery is in motion; and

(b) no account shall be taken of any person carrying out lubrication, or the mounting or shipping of belts of any part of transmission machinery used in any process in a factory where the Chief Inspector has by certificate in writing declared that he is satisfied that owing to the

continuous nature of the process in such a factory the stopping of that part will seriously interfere with the continuous operation of the process in such a factory; provided, however, the lubrication or the mounting or shipping of belts shall be carried out by such method and in such circumstances and subject to such conditions as the Chief Inspector may in his certificate specify.

(2) In respect of the examination, lubrication or adjustment of machinery in motion as mentioned in paragraph (1), the following provisions shall apply -

(a) the examination, lubrication or adjustment as aforesaid shall be carried out only by a male person of twenty years of age or above who has been trained for the work to be carried out and who is acquainted with any hazards that may arise in the course of such examination, lubrication, or adjustment. For the purpose of this paragraph, his clothing including any fastener thereto shall not expose any loose ends;

(b) such person while carrying out the examination, lubrication or adjustment shall be within sight or hearing of another person who has been instructed as to the steps to be taken in case of emergency so that immediate aid shall be available, when necessary, to the person carrying out the examination, lubrication or adjustment; and

(c) any ladder in use for the carrying out of such examination, lubrication or other operation shall be securely fixed or lashed, or firmly held by a person stationed at the foot of the ladder:

Provided that no transmission machinery which is safe by reason of its position only shall be lubricated by hand while such machinery is in motion.

## **6. Construction and maintenance of fencing.**

All fencing or other safeguards provided in pursuance of these Regulations shall be of sound construction and constantly maintained and kept securely fastened in position at all times when the parts required to be fenced or safeguarded are in motion or in use except when any such parts are necessarily exposed in motion for examination and for any lubrication or adjustment shown by such examination to be immediately necessary and all such conditions as may be specified in these Regulations are complied with.

## **7. Opening in fence.**

No opening in any fence shall be of such dimensions that any person can touch the moving parts of the machinery enclosed by the fence:

Provided that guard-rails may be installed where the clearance between the nearest exposed moving part of the machinery and the guard-rail exceeds twelve inches but does not exceed twenty inches.

## **8. Point of operation.**

The point of operation of any machine shall be effectively fenced.

## **9. Construction of machinery.**

In respect of every machine constructed in or imported into the Malaysia after the date of the implementation of these Regulations being a machine intended to be driven by mechanical power:

(a) every set-screw, pin, bolt or key or any revolving shaft, spindle, wheel, or pinion shall be so sunk, encased, or otherwise effectively guarded as to prevent danger;

(b) every spur and other toothed or friction gearing which does not require frequent adjustment while in motion shall be completely encased unless it is so situated as to be as safe as it would be if completely encased.

#### **10. Starting and stopping appliance.**

(1) Every machine intended to be driven by mechanical power shall be provided with an efficient starting and stopping appliance the control of which shall be in such a position as to be readily and conveniently operated by the person operating the machine in his normal working position.

(2) Where pedals are used to actuate machines or parts of machines, an automatic locking device shall be attached to the pedal or an inverted U- shape guard shall be fastened to the floor over the treadle leaving sufficient clearance for the foot of the operator between the treadle and guard.

(3) No person shall start any machinery unless and until every precaution has been taken to ensure that no other person or persons will be injured or be rendered liable to injury or be placed in a hazardous position by the operation of such machinery.

#### **11. Electrical apparatus.**

All electrical equipments and installations shall be of such construction and so installed and maintained as to prevent fire hazard and danger from contact with moving parts and live parts. Such electrical equipments and installations shall conform with all the requirements prescribed in any written law relating to electrical equipments and installations and shall have been approved by the authorities appointed by the said law.

#### **12. Reciprocating movement of machine or material.**

In every machine where a horizontal reciprocating motion is imparted to any part of the machine or to the material carried thereon there shall be a clearance of not less than eighteen inches between the reciprocating part of such machine, including the material carried thereon, at the end of each stroke and any fixed structure.

### **PART II PRIME MOVERS**

#### **13. General provisions.**

In respect of every prime mover the following general provisions relating to fencing and safety shall apply:

(a) Every flywheel shall be securely fenced whether the flywheel or prime mover is situated in an engine house or not, and every part of every electric generator, motor or rotary converter and every flywheel connected thereto shall be securely fenced unless it is in such position or of such construction as to be as safe to every person employed or working on or entering into the premises as it would be if securely fenced:

Provided that where barring of a flywheel may be necessary, provision shall be made for this to be done on the periphery of the wheel through a slot in the guard.

(b) Cranks, cross heads, connecting rods, tail rods, extension piston rods or cooling fans, unless protected by construction or location shall be securely fenced.

(c) Every projecting rotating shaft and every collar and set-screw on any rotating shaft shall be securely fenced:

Provided that where such shaft or part of such shaft is necessarily exposed for the purpose of starting a prime mover the fence may be of the portable type. When starting has been effected, the fence shall be placed in position.

(d) Every prime mover shall be provided with a governor to control automatically the speed of the prime mover:

Provided that a governor need not be fitted where the prime mover is-

(i) of self-regulating type; or

(ii) of such design that the maximum possible speed does not exceed the safe speed of rotation.

(e) Where any prime mover is started by gas bled from a cylinder of a prime mover, arrangements shall be made to ensure that the temperature of the gas entering the receiver does not exceed one hundred and twenty-five degrees Fahrenheit.

#### **14. Exhaust gases.**

(1) The exhaust gases from every internal combustion engine and every non-condensing steam engine shall be led to a position of safety in the open air.

(2) Every such exhaust pipe shall be covered with heat insulating material at any point not otherwise safe from contact by any person.

(3) The exhaust from every internal combustion engine and every non-condensing steam engine shall be effectively silenced.

#### **15. Fuel tank.**

No fuel storage or service tank shall be installed directly above any internal combustion engine, exhaust pipe, unfired pressure vessel or steam boiler.

### **PART III TRANSMISSION MACHINERY**

#### **16. General provisions.**

In respect of dangerous parts of transmission machinery the following provisions relating to fencing and safe operation of such parts shall apply-

(a) All shafting within a height of six feet six inches from any floor or working platform shall be guarded with:

(i) casings enclosing the shafting completely; or

(ii) casings in the form of a trough enclosing either the top and both sides or the bottom and both sides of the shafting as the location requires. The sides of such casings shall extend to a distance at least equal to the diameter of the shaft and to a point not more than six inches above the floor.

(b) All shafting installed under work benches shall be fitted with a metal trough along the complete length of, and covering the top and both sides of, the shafting and extending at least two inches below the bottom of the shafting.

(c) (i) Every trench or pit in every floor for the purpose of housing and transmission machinery shall be-

(a) provided with close fitting covers flush with the level of the floor; or

(b) provided with guard-rails and toe- guards at least four inches high :

Provided that where the space between the rails or stanchions or both are filled in toe-boards shall not be required, but provision shall be made for the lubrication of such transmission machinery from above floor level.

(ii) No person shall enter any trench or pit containing transmission machinery while such machinery is in motion.

(d) The contact point of every friction drive shall be fenced and every arm or spoke friction drive or web friction drive with holes in the web shall be entirely enclosed with guards.

(e) (i) Every clutch within a height of six feet six inches from any floor or working platform shall be fenced.

(ii) The shifting part of every jaw clutch shall be attached to the driven shaft, that is to say, the shaft that will be idle when the clutch is disengaged.

(iii) Every manually operated clutch shall be so arranged that the clutch is operable from a position wholly outside the fencing.

(f) (i) Every exposed gear train within a height of six feet six inches from any floor or working platform shall be guarded in one of the following ways:

(a) with a complete enclosure; or

(b) if the gear wheels are of the solid disc type, with a band guard covering the face of the gear and having flanges extending inward beyond the root of the teeth on the exposed side or sides.

(ii) Where a gear train is situated within the framework of any machine it need not be fenced unless such gear train is within two feet of any opening in the framework:

Provided that no such openings shall be of such dimensions that any person can touch any gear train enclosed by the framework.

(g) Every sprocket and every chain drive within a height of six feet six inches from any floor or working platform shall be totally enclosed by a guard.

(h) (i) Every part of every belt and every rope drive within a height of six feet six inches from any floor or working platform shall be fenced by-

(a) a guard; or

(b) a surrounding guard-rail which shall be carried to a height of at least six inches above the top of the largest pulley, and shall not in any case be of a height less than three feet six inches from such floor or working platform.

(ii) Where horizontal or inclined belts or ropes pass over a passage way, or a place where persons are regularly working, a guard or trough of sufficient strength to contain the belt or rope in the event of it breaking shall be fitted.

(iii) Where the upper and lower runs of a horizontal belt are so located that passage of persons between them would be possible-

(a) the passage shall be completely barred against use by guard rails or other substantial barriers; or

(b) there shall be provided over the lower run a solid platform guarded on either side with a solid barrier or with a railing completely filled in with mesh or other filler; and the upper run shall be provided with a guard which will prevent contact with it by either persons or objects carried and such guard shall be adequate in strength to contain the belt in the event of breakage.

(j) The portion of any pulley within a height of six feet six inches from any floor or working platform shall be fenced as part of the belt or rope drive in accordance with the provisions of paragraph (h) (i).

Provided that-

(i) no pulley with broken or cracked rims or spokes or arms shall be used;

(ii) no solid pulley of cast iron shall be run at a rim speed exceeding six thousand feet per minute;

(iii) no split pulley of cast iron shall be run at a rim speed exceeding four thousand feet per minute;

(iv) no split pulley of steel shall be run at a rim speed exceeding seven thousand feet per minute.

(j) (i) Cone or stepped pulleys within a height of six feet six inches from any floor or working platform, unless situated within the framework of any machine, shall be fenced.

(ii) Cone or stepped pulley belts manipulated by hand shall be fastened at the joint by raw-hide or other non-metallic lacing:

Provided that the provisions of this paragraph shall not apply to belt or chain conveyors.

## **17. Mounting and dismounting belts.**

No person shall mount or dismount any driving belt or rope, not being a cone pulley driving belt, while any part of the connected transmission machinery is in motion:

Provided that in the case of a continuous process such mounting or dismounting may be carried out by an experienced person who shall use a suitably designed belt pole provided for the purpose.



## **18. Belt perches.**

(1) Belt perches shall be provided to prevent idle belts from resting on shafts.

(2) Inclined belts or ropes used for driving machines from an overhead lineshaft shall not pass over a passage way or place where persons are working if the angle of the belt or rope exceeds twenty degrees to the vertical.

(3) When a driving belt is not in use it shall not be permitted to ride upon any revolving shaft, and a suitable striking gear or other efficient mechanical appliance shall be provided and maintained and used to move a driving belt to and from a loose pulley. Any such gear or appliance shall be constructed, placed and maintained as to prevent a driving belt from creeping back on to the fast pulley. A belt striking gear or other similar appliance shall also be so constructed that it may only be operated from a position outside the fencing

## **19. Lubrication of transmission machinery.**

(1) No person shall lubricate, adjust or apply dressing to any transmission machinery in motion unless the act of applying the lubricant, adjusting or applying the dressing can be performed from a position outside the fencing.

(2) No transmission machinery which is safe by reason of its position shall be lubricated by hand while in motion.

## **20. Power cut-off device.**

(1) In every part of a factory where work is carried on, efficient devices or appliances shall be provided and maintained by which the power can promptly be cut off from the transmission machinery located in that part of the factory.

(2) Where an Inspector by notice in writing served on the occupier of a factory so requires, there shall be installed and maintained in the factory such devices or appliances, as the Inspector may in such notice specify, for

(a) the interruption of the mechanical power supplied to any specified machine; and

(b) the prompt stopping or bringing to rest of any specified machine after the mechanical power supplied to it has been interrupted.

(3) It shall be the duty of the occupier who has been served with the notice described in paragraph (2) to comply with the requirements specified in the notice including the positions in which the devices or appliances shall be installed when such positions are specified in the notice.

## **21. Hoisting machine.**

Every overhead structure, crane, block, sling and other appliance for lifting a load shall be of sound construction and in every way suitable for the purpose.

**PART IV  
DRIVEN MACHINERY**

**22. Abrasive, grinding, polishing and buffing machinery.**

(1) In respect of abrasive, grinding, polishing and buffing machinery, the provisions in this regulation relating to fencing and safety shall apply.

(2) In this regulation the following terms have the meanings hereby respectively assigned to them-

"abrasive wheel" means a power-driven wheel composed of abrasive particles held together by artificial or natural mineral or organic bonding and used for grinding;

"buffing wheel" means a power-driven wheel composed of laminated felt, or cotton-sheeting disc with mild abrasive compounds applied loosely on the periphery of the wheel, and used for obtaining highly finished surfaces on metals and other materials;

"grindstone" means a power-driven wheel composed of natural or manufactured sandstone and includes a metal wheel or cylinder filled with blocks of natural or manufactured sandstone;

"polishing wheel" means a power-driven wheel composed in whole or in part of textile fabric, felt, leather, paper, wood or other material with a glued coating of abrasive particles and used for polishing or light grinding of metals or other materials;

"tumbling barrel" means a power driven rotating or reciprocating cylinder, mounted on a frame and used for cleaning and polishing small castings or other parts by tumbling them against one another with or without added cleaning or abrading materials.

**General provision.**

(3) (a) Every floor stand for grinding, polishing or buffing machinery shall be rigidly constructed, sufficiently heavy for the wheels, discs, tables or drums used and securely mounted on substantial foundation to withstand vibration.

(b) Protection for the eyes of workers on or around grinding, polishing or buffing machinery shall be provided.

**Wet grinding.**

(c) Where wet grinding is employed, no abrasive wheel or grindstone shall be allowed to remain at rest with any portion of the wheel in contact with the coolant.

**Abrasive wheel.**

(4) (a) Every abrasive wheel, except an abrasive wheel used for internal grinding, shall be-

(i) positioned in such a manner so as to reduce to a minimum the damage resulting from violently projected fragments of the wheel if the wheel should burst;

(ii) fitted with a hood, the construction of which shall be in accordance with the specification contained in the Third Schedule;

(iii) carefully inspected before mounting on its spindle;

(iv) kept circular, for which purpose suitable tools shall be kept in readiness; and

(v) clearly marked with the manufacturer's guaranteed maximum operating speed, and no abrasive wheel shall be run at a speed in excess of the manufacturer's guaranteed speed.

**Defective wheel.**

(b) No person shall use any abrasive wheel which is in any way defective.

**Mounting.**

(c) On first mounting a new abrasive wheel it shall be run at the manufacturer's guaranteed maximum operating speed for at least five minutes before applying any work to the wheel; and during such period no person shall be in a position in the plane in which the wheel is rotating.

**Spindle.**

(d) Every spindle on which an abrasive wheel is mounted shall be-

(i) made of steel;

(ii) of such diameter as to ensure rigidity and freedom from vibration due to flexure; and

(iii) so threaded that the nuts will tend to tighten as the spindle rotates. The length of thread is such that, when the wheel is mounted and the spindle nut is tightened against the flange, the whole surface of the nut thread bears on the spindle thread.

**Work rest.**

(e) Every non-portable abrasive wheel shall be provided with a work rest which-

(i) is shaped to fit the contour of the wheel; and

(ii) is securely fixed in position as close to the wheel as is possible, and in no case more than one-eighth of one inch from the rim and side of the wheel.

**Flanges.**

(f) Every abrasive wheel of six inches diameter or over shall be mounted in flanges as prescribed in the Fourth Schedule:

Provided that the provisions of this sub-paragraph shall not apply to any abrasive wheel which is cemented to metal backs or mounted in chucks.

**Grindstone.**

(5) Every grindstone shall be fitted with a hood of sheet metal.

**Polishing and buffing wheel spindle.**

(6) Every spindle of every polishing or buffing wheel shall be so guarded as to prevent contact with it, whether a wheel is mounted on it or not.

**Tumbling barrels.**

(7) Every tumbling barrel shall be-

(a) enclosed or guarded to sufficient height so as to prevent any person from coming into contact with the tumbler when it is in motion;

(b) provided with a substantial device to prevent movement of the drum while being loaded or unloaded; and

(c) provided with dust tight or efficient exhaust device for removal of dust or enclosed in dust tight booths or rooms connected to efficient exhaust systems.

### **23. Machinery using rolls.**

(1) In respect of every machine in which rolls are used, the provisions in this regulation relating to fencing and safety shall apply.

(2) In this regulation the following terms have the meanings hereby respectively assigned to them-

"roll" means two or more cylindrical bodies placed a small distance apart and rotatable in opposite directions to draw metallic or non metallic material between them in order to compress or crush or shape it, to make it smooth or glossy, to print on it, or to distribute or to spread a viscous liquid on its surface, and includes a single roll revolving over a moving flat bed and used in similar operations;

"calender" means a machine with smooth rolls used for pressing cloth, leather, molten glass, paper or rubber;

"crushing roll" means a machine ordinarily provided with corrugated or toothed rolls used for crushing materials, dry or wet;

"roller mill" means a machine ordinarily provided with smooth or corrugated rolls used for grinding or mixing chemicals, enamels and paints, food products, printing inks rubber, soap and other materials, or for pressing materials together;

"rolling mill" means a machine used for reducing hot or cold metal bars, billets, ingots, plates, rods and slabs to specified profiles or sections or for finishing such materials by passing them through a set or train of driven rolls;

"cylinder press" means a printing press in which the paper or other material is supported on revolving cylinders and forced against printing surfaces also supported on reciprocating flat beds;

"rotary press" means a printing press in which the paper or other material supported on revolving cylinders is forced against printing surfaces also supported on revolving cylinders.

### **Fencing of moving parts.**

(3) (a) Belts, coupling, flywheels, gears, pinions, pulleys, shafts, sprockets, wobblers and other moving parts on the sides of every machine using rolls if located within six feet and six inches of the floor or working level and not enclosed by the housing of the machine shall be effectively fenced.

### **Fencing of nips.**

(b) Every running-in point or nip of every set of rolls shall, unless such rolls are safe by reason of their position, be fenced.

### **Safety device.**

(c) Rolls on machine not specifically mentioned in this regulation shall be equipped with-

(i) quick power disconnecting or reversing device within easy reach of either hand or either foot of the operator; and

(ii) a fixed or self adjusting barrier on the in-running side of the rolls so arranged that the material to be processed can be fed to the rolls without permitting the fingers of the operator to be caught between the rolls or between the guard and the rolls.

#### **Cleaning of rolls.**

(d) No person shall attempt to clean rolls without first-

(i) stopping the machinery, and

(ii) disconnecting the power, except on large machines which cannot be turned by hand and are equipped with slow motion power control.

#### **Rolling mills.**

(4) (a) Reels on rod rolling mills shall be screened off, to prevent ends of rods from whipping, breaking off, or jumping out of the rolls.

(b) Before changing rolls, making readjustments or starting repairs on rolling mills, all switches or valves controlling machinery shall be locked.

(c) Locks on control switches or control valves for rolling mill machinery shall not be removed until the responsible person has ascertained that all safeguards are in place and all workers and tools are in the clear.

(d) Before starting rolling mills for any purpose, the responsible person or operator shall give warning by means of audible or visible signals, followed by an interval of not less than thirty seconds to ensure that everyone is out of danger.

#### **Crushing rolls and roller mills.**

(5) Every crushing roll and roller mill:

(a) shall be effectively fenced except over the necessary openings for feeding and discharging the material being processed, which openings shall be provided with hoppers, chutes, or spouts or platform guard so constructed that the fingers of the operator cannot come into contact with the rolls; and

(b) where toxic or irritating dusts, fumes or vapours are liberated from the material being processed, shall be properly connected to efficient exhaust systems.

#### **Dough rollers and brakes.**

(6) (a) Every dough mee or meehoon roller shall be fenced by-

(i) a feeding chute and a bridge or tunnel guard as illustrated the Fifth Schedule; or

(ii) a hopper over the rolls of such design that the operator cannot reach the nip of the rolls.

(b) Every dough brake shall be provided with guards over the tops of the rolls and if not equipped with automatic feeding devices, shall be provided both in front and behind the rolls with grid guards which, on contact with the hands or arms of the operators, will actuate mechanisms which stop and reverse the motion of the rolls.

#### **Cylinder printing presses.**

(7) (a) The openings in the frame of every cylinder press near the point of operation, and the spaces between the segments and the register racks shall be fenced.

(b) No person shall change formes, make ready, adjust, clean or oil any cylinder press without first disconnecting the power.

### **Rotary printing presses.**

(8) (a) Every rotary press shall be fenced by-

(i) a hinged metal guard over the exposed part of each plate cylinder; and

(ii) complete metal enclosure of both sides of each inking mechanism, from the fountain to the plate cylinder.

(b) Every rotary press shall be provided with means for turning the press by hand.

(c) Where a pit is required under any rotary press it should not be less than four feet in depth to facilitate safe access for necessary adjustment, oiling or repairs.

(d) Every slitter on every rotary press shall be fenced.

### **Rubber creping rolls machinery.**

(9) (a) Every horizontal two roll milling machine employed in the manufacture of crepe rubber shall be provided with-

(i) a platform guard in accordance with the specification given in the Sixth Schedule: Provided that the Chief Inspector may, by certificate in writing and subject to such conditions as he may stipulate, exempt any such machinery from the provisions of this requirement; and

(ii) a device for stopping the rolls and such device shall-

(a) stop the rolls with no material between the rolls within the period of three seconds from the time it is operated;

(b) be so placed as to be operated by the operator from his normal working position;

(c) disconnect the machine from the source of power;

(d) where a clutch is fitted between the machine and the source of power, disengage such clutch by releasing a failing weight on the clutch withdrawal mechanism and such weight shall be sufficiently heavy to prevent the clutch remaining in engagement while the weight rests on the withdrawal mechanism;

(e) be capable of being re-set from a position wholly outside the fencing;

(f) not be of the pendant, or of the push-button type:

Provided that where a horizontal two roll milling machine employed in the manufacture of crepe rubber is powered by an electric motor, such a machine shall need only to comply with the provisions of sub-paragraph (i) and sub-paragraph (ii) (a), (b) and (e).

(b) Every horizontal two-roll milling machine employed in the milling of scrap rubber shall be provided with a mechanical device designed to force the rubber between the rolls.

## Rubber sheeting machine

(10) (a) Every continuous rubber sheeting machine shall be fitted with a tunnel guard at the first or feeding head, and where practicable at all other heads.

(b) Every tunnel guard shall be of substantial construction and at the first head have a clear vertical opening not exceeding one and three quarter inches at a distance not less than nine inches from the nip of the rolls; and where fitted to the other heads, the vertical opening shall not be greater than one inch at a distance of not less than six inches from the nip of the rolls.

(c) Where it is impracticable to fit tunnel guards at heads other than the first head, fencing shall be provided which will prevent access to such heads; and the fencing shall be so interlocked with the clutch or source of power that the machine cannot be operated unless the fencing is in position.

(d) Every continuous rubber sheeting machine shall be provided with a device for stopping the machine and such device shall-

(i) stop the machine with no material between the rolls within a period of three seconds from the time it is operated;

(ii) be so placed as to be operated easily by every person employed on the machine;

(iii) where a clutch is fitted between the machine and the source of power, disengage such clutch by releasing a falling weight on the clutch withdrawal mechanism and such weight shall be sufficiently heavy to prevent the clutch remaining in engagement while the weight rests on the withdrawal mechanism; and

(iv) be capable of being reset from a position wholly outside the fencing:

Provided that where interlocked fencing is fitted in compliance with sub-paragraph (c) a falling weight need not be fitted.

(e) The stopping devices referred to in paragraph (9) (a) (ii) and in paragraph (10) (d) in this regulation shall be tested by a responsible person, appointed by the occupier, before the start of work on every day the machine is used.

## Laminators

(11) (a) Every vertical or oblique two roll laminator shall-

(i) if both rolls are power driven or the lower roll only is power driven, be provided with a tunnel guard, and the clear vertical opening of such guard shall not be greater than one inch at a distance of not less than four and one-half inches from the nip of the rolls; or

(ii) if the upper roll only is power driven, be provided with a screen so fitted as to provide an aperture through which the material may pass and such aperture shall not be greater in height than the thickness of the uncompressed material plus one quarter of one inch, at a distance of not less than one inch, from the vertical tangent to the upper roll, and such screen shall effectively prevent direct access to the nip of the rolls.

(b) Every horizontal two-roll laminator shall as far as practicable be fitted with tunnel guards or screens in accordance with the provisions of sub-paragraph (a) above and where such tunnel guards or screens are not practicable, fencing to the satisfaction of the Inspector shall be fitted at the nip of the rolls.

(c) Every two-roll laminator shall be provided with a device for stopping the rolls, and such device shall comply with the provisions of paragraph (9) (a) (ii).

### **Scrap rubber washer.**

(12) Every scrap rubber washer shall be fitted with-

(a) a steel mesh guard, so positioned and of such dimensions that the fingers of the operator or any other person are prevented from contact with the rolls. Such guard shall be interlocked with the drive so that it cannot be opened unless the clutch is disengaged or the power otherwise disconnected from the machine and the machine cannot be started when the guard is not in the closed position; or

(b) a device for feeding scrap rubber into the machine which effectively prevents the fingers of the operator or any other person from contact with the rolls.

### **Calenders.**

(13) Every calender except calenders designed for a laboratory and in use in such a laboratory shall be provided with a device-

(a) to prevent the hands of the operator or any other person coming into contact with the nip of the rolls; and such device shall be either-

(i) an arrangement of fixed distance bars; or

(ii) rigid and close fixed guards; or

(iii) a sensitive distance bar so constructed that pressure upon the bar shall automatically stop the machine; and

(b) for stopping the machine; and such device shall comply with the provisions of paragraph (9) (a) (ii):

Provided that where a sensitive distance bar is fitted in accordance with the provisions of subparagraph (a) (iii) of this paragraph no other stopping device need be fitted.

## **24. Woodworking saws.**

(1) In respect of wood working saws the provisions in this regulation relating to fencing and safety shall apply.

(2) In this regulation the following terms have the meanings hereby respectively assigned to them-

"band saw" means a machine for sawing timber or lumber, equipped with one or more endless steel bands with a continuous series of notches or teeth on one or both edges and running over a pair of wheels or pulleys that are usually mounted one above the other or mounted horizontally;

"circular saw" means a machine for sawing timber or lumber, equipped with one or more endless steel discs with a continuous series of notches or teeth on their peripheries, ordinarily mounted on horizontal arbors or spindles located-

(i) beneath work tables or benches provided with slots through which the upper portion of the blades projects to cut material pressed against the blades; or

(ii) above work tables or benches, to the level of which the blades are dropped, when needed, to cut material pressed against the blades; or

(iii) in frames suspended from overhead shafting so that they can be swung to cut through material resting on the tables;



"crosscut saw" means a woodworking saw with teeth shaped and set for sawing across the grain of the wood;

"equaliser" means a machine equipped with two circular crosscut saws for cutting barrel staves, bolts, box-boards, vehicle stock and other lumber products to fixed lengths by simultaneously trimming both ends;

"mill" means any kind of woodworking saw used for reducing logs to rough-edge lumber or timber, and includes the carriage and the driving machinery;

"ripsaw" means woodworking saw with teeth shaped and set for sawing along the grain of the wood;

"swing or pendulum saw" means a saw frame suspended from a shaft above the work table and equipped with a single circular crosscut saw, which is pulled forward to make cuts, with the extreme lower edge of the saw passing through a special slot in the table or bench top, and automatically retires from the saw cut when released;

"travelling saw" means a machine equipped with a single circular crosscut saw that moves forward in a stationary table when cutting.

### **Saws**

(3) (a) Saws shall be driven by prime movers of sufficient power to avoid all risk of jamming or wedging of the wood worked. The speed of cutting and the teeth of the saws shall be suitable for the nature of the work to be done.

(b) Saw blades shall be maintained in good condition and shall not have any cracks. Such blades shall be perfectly regular, be correctly sharpened, and correctly set.

#### **Removal of waste.**

(c) The floors of all rooms or buildings in which wood working saws are used shall be kept free from obstruction and as far as reasonably practicable from wood wastes. Where practicable the saws shall be provided with suitable suction hoods, properly connected to efficient exhaust systems.

#### **Mill sawyers stand.**

(d) Every stand for head sawyers on a band mill or circular mill shall be protected by shields not less than three feet and six inches in height, constructed

- (i) of iron or steel, not less than a quarter of one inch thick; or
- (ii) of planks two inches or more in thickness; or
- (iii) of reinforced concrete, eight inches or more in thickness,

and such stand shall be fitted with levers, push buttons, switches, valves or other devices, to enable the sawyer to stop the mill without leaving the stand. There shall also be means for securely locking all the controls in the "off" position.

#### **Log carriages for mills.**

(e) Every log carriage or saw carriage for band mill or circular mill shall be-

- (i) of iron or steel, or of heavy timber mortised or dovetailed and through-bolted; and
- (ii) completely decked over, to prevent persons from stepping through openings in frames.

### **Stands for log setters.**

(f) Every stand for log setters on band or circular mill long carriages shall be provided with anti-slip surfaces.

(g) No roof trusses, timbers or other parts of the building or fixtures shall be located within six feet and six inches above the surface of band or circular mill log carriage decks.

### **Circular saw.**

(4) (a) Every woodworking circular saw shall be so installed as to prevent undue movement and excessive vibration, and shall be fenced in the following manner-

(i) that part of the saw blade below the table shall be fenced by two metal plates, one on each side, not more than six inches apart and extending from the underside of the table to a point not less than two inches beyond the tips of the saw teeth; and such metal plates shall be of not less than No. 14 gauge in thickness unless they are provided with beaded edges, in which case No. 20 gauge material may be used;

(ii) the top of the saw blade shall be fenced by a strong, easily adjustable guard with side flanges at the sides of the saw and the guard shall be kept so adjusted that the said flanges shall extend below the roots of the teeth of the saw; and the guard shall extend from the top of the riving knife to a point as low as is practicable at the cutting edge of the saw:

Provided that in the case of circular rip saws used exclusively for breaking down logs a guard approved by the Chief Inspector shall be used; and

(iii) behind and in direct line with the saw blade there shall be a riving knife which shall have a smooth surface, shall be strong, rigid and easily adjustable and shall comply with the following conditions:

(a) the edge of knife nearer the saw shall form an arc of a circle having a radius not exceeding the radius of the largest saw used on the bench;

(b) the knife shall be slightly thinner than the saw kerf and slightly thicker than the saw blade and shall not be less than two inches in width at the top of the saw table;

(c) the knife shall be maintained as close as is practicable to the saw blade, and at the level of the bench the distance between the front edge of the knife and the teeth of the saw blade shall not exceed half of one inch; and

(d) the knife shall extend upwards from the bench to within one inch of the top of the saw blade:

Provided that in the case of a saw of a diameter of twenty-four inches and over a riving knife need not be fitted if other means of preventing the wood bending on the saw blade are adopted.

(b) A suitable push stick shall be kept available for use at the bench of every circular saw:

Provided that the push stick need not be used at any cross-cut circular saw or rip saw used exclusively for breaking down logs.

(c) No person shall use a damaged circular saw blade.

(d) The packing of a circular saw blade shall be carried out only when the saw is at rest.

(e) The speed of any circular saw blade in revolutions per minute shall not exceed the quotient of 43,200 divided by the diameter of the saw blade measured in inches.

(f) The feed rollers on any circular saw bench shall be fenced.

### **Equalisers.**

(5) (a) Every equalising saw shall be covered so far as practicable on the tops and back and when, mounted on arbors outside the bearings, and also on the outer part of each saw to a point below the bottom.

(b) Every equalising saw equipped with carriers shall be provided with springs or weights to keep the carriers away from the saws except when the stock is being fed.

### **Travelling saw.**

(6) Every hood guard on travelling saw shall-

(a) be fastened securely to the arbor or to the saw table;

(b) cover the saw when running idle;

(c) extend not less than two inches in front of the saw teeth when the saw is in its back position; and

(d) be limited in width so as to give a clearance of a quarter of one inch on each side of the saw blade.

### **Swing saw.**

(7) (a) Hood guards on swing saws or pendulum saws shall extend below the arbors, with the side cover next to the end of the arbor preferably hinged for access to the saw.

(b) The lower part of swing saws shall be guarded when the saw is in its back position.

(c) Swing saws shall be provided with-

(i) limit chains or other positive devices which will prevent the front edge of the saw from advancing beyond the front edge of the saw table;

(ii) counterweights or other effective devices which will automatically return the saw so that the front edge of the saw is not less than one inch behind the back edge of the saw table when the saw is released by the operator at any point of its travel; and

(iii) latches or other positive means which will prevent the saw from rebounding when swinging back.

(d) Belts on swing saws shall be enclosed-

(i) for the entire length on the front toward the operator; and

(ii) to a height not less than six feet and six inches above the floor or working level on the back and on both sides.

### **Band saw.**

(8) (a) Every vertical bandsaw shall be fenced as follows-

(i) the bandwheels and saw blade (except that portion of the saw blade between the table and the guide) shall be enclosed by a guard the construction of which is not less strong than of a guard having a frame of three-eighths of one inch diameter steel bar or 3/4" X 3/4" X 1/8" steel angle with filling of 12 gauge wire in a mesh of one and a

half inches; and shall extend beyond the bandwheel rims for not less than three inches:

Provided that a guard need not be fitted to the driving belt side of the bottom bandwheel if such side is safe by reason of its position;

(ii) the guard at the front of the upper bandwheel shall be hinged and the lower bandwheel guard shall be hinged or removable;

(iii) the guard covering that part of the saw blade between the guide and the upper bandwheel shall be attached to the guide and shall move vertically with the guide; and

(iv) access to the lower bandwheel in the pit shall be prevented.

(b) Every horizontal bandsaw shall be fenced as follows-

(i) the bandwheels shall be completely enclosed; and

(ii) the saw blade shall be completely enclosed except as is necessary to permit passage of the material being sawn.

#### **Other saws.**

(9) Every saw not otherwise described in the regulation and which is moved towards the material shall be fenced by-

(a) a guard which exposes the cutting portion of the saw blade only when the saw is in use; and

(b) in the case of a cross-cut saw, a balance weight or other device to hold the saw away from the cutting position when not actually cutting.

#### **25. Planning machine.**

(1) No planning machine, except mechanically fed planning machinery, shall be used for overhand planning unless it is fitted with a cylindrical cutter block; and no piece of wood less than twelve inches in length shall be planned on such machine unless a safe-holder is used.

(2) Every planning machine used for overhand planning shall be fenced by a "bridge" guard capable of covering the full length and breadth of the cutting slot in the bench, and so constructed as to be easily adjustable in the vertical and horizontal directions.

(3) The feed roller of every planning machine used for thicknessing, except a combined planner and thicknesser, shall be provided with an effective guard, which will give a clearance not greater than a quarter of one inch regardless of the thickness of the wood.

#### **26. Spindle moulding machine.**

(1) The cutter of every spindle moulding machine shall be fenced where practicable.

(2) A suitable spike, push-stick, jig or holder shall be provided and kept available for use at the bench of every spindle moulding machine.

## **27. Grooving and tenoning machine.**

The cutting heads and knives of every grooving and tenoning machine shall be fenced by sheet metal guards securely fastened to the machine.

## **28. Chain-mortise machine.**

Every chain mortise machine shall be provided with a telescoping self adjustable guard, covering the sprocket wheel and the chain down to the top surface of the material being processed.

## **29. Combined woodworking machine.**

Combined machines having a number of tools shall be so constructed that only one tool can be used at a time, and provisions shall be made whereby it is possible to disengage each tool separately and each tool on combined machines shall be provided with the protective devices prescribed for non-combined machines.

## **30. Agitating, stirring, or mixing machines.**

(1) In respect of agitating, stirring, or mixing machines, the following general provisions relating to fencing and safety shall apply-

(a) Where practicable, every mixing operation involving liberation of dust, fumes or mists shall be effected in closed apparatus.

(b) Every horizontal and vertical mixing machine shall be fenced by a cover fitted with an interlocking device so arranged that power cannot be applied to the agitator unless the cover is within three inches of complete closure; and so arranged that the cover cannot be opened further than three inches of complete closure when power is being applied to the agitator.

### **Open top agitator and mixing tank.**

(c) Where the top of an open agitator, beater or paddle tank is less than three feet and six inches above the floor or working level, adequate railings shall be furnished on all open sides, and where it is less than six inches above the floor, toeboards shall be provided.

(d) Every machine with mechanical agitating or stirring devices installed for use with removable bowls shall be provided with interlocks to prevent access to such devices while in motion.

### **Dough mixer.**

(2) (a) Every dough mixer shall be provided with tight fitting covers of substantial material over the tops of the mixing bowls.

(b) Every horizontal non tilting dough mixer provided with-

(i) a fixed cover shall be equipped with valve controlled feed to and discharge from the mixers; or

(ii) a hinged or removable cover shall be equipped with an interlocking device so arranged that

(a) the cover cannot be opened until the blade-driving mechanism has been stopped; and

(b) the blades cannot be set in motion again until the cover is in place on the mixing bowl.

(c) Every horizontal tilting-type dough mixer, in which the rotating blades are not used for discharging, shall be provided with interlocking device or automatic power cut-off which-

(i) will disconnect the power from the mixing blades when the bowl starts to tilt; and

(ii) will prevent application of the power again until the bowl has been returned to its operating position.

(d) Every horizontal tilting-type dough mixer that is cleared by rotating the blades while the bowl is in the tilted or unloading position shall be provided with an interlocked cover which will prevent access to the rotating blades while the bowl is in the vertical position but will allow a limited amount of opening of the cover for the discharge of the dough when the bowl is tilted.

### **Other mixing machines.**

(3) (a) In the case of other mixing machines of the dough mixer type (in the food and other industries), that is machines which present crushing or shearing hazards between the blades or between the blades and the bowls, every such mixing shall be equipped with safety devices as provided in the foregoing provisions for dough mixers.

(b) In the case of other mixing machines of the tumbling barrel type every such mixing machine shall be equipped with safety devices as provided in regulation 22 (7) for tumbling barrels.

### **31. Mincing machinery.**

(1) The hopper of every mincing machine shall be fenced by a tray; and the feed opening in such tray shall be of such diameter or so fenced as to prevent access to the danger area.

(2) A push stick shall be provided at every mincing machine.

### **32. Grinding mills and pulverisers.**

(1) Every grinding mill, husker, disintegrator, hammer mill, extruder and every similar machine shall be fenced by a hopper and outlet chute; and such hopper and outlet chute shall be of such size and arrangement as to prevent the operator from coming into contact with the moving parts.

(2) Where the feed to any machine of the class given in paragraph (1) is through an opening in a floor or feeding platform such opening shall have a raised cover and such cover shall be within six inches of the floor or feeding platform and shall extend not less than nine inches beyond the opening in all horizontal directions:

Provided that no cover need be fitted where the size and shape of the feed chute is such that no part of the operator can reach any moving parts.

### **33. Centrifuges and hydro-extractors.**

(1) Every centrifuge and hydro-extractor shall have the maximum permissible speed stamped on the basket thereof; and no centrifuge or hydro-extractor shall be run at a speed in excess of the maximum permissible speed.

(2) The maximum permissible speed shall be the manufacturer's designed speed; and where this is not obtainable the following speeds shall not be exceeded-

(a) 30 inch diameter basket ... .. 1,200 r.p.m.

(b) 48 inch diameter basket ... .. 750 "

(c) 60 inch diameter basket ... .. 500 "

(3) (a) Every centrifuge and hydro-extractor shall be provided with a brake.

(b) Every centrifuge shall be provided with a substantial lid. Where practicable this lid shall be provided with an interlock or other approved device that will prevent the lid being opened while the basket is in motion and prevent the operation of the basket while the lid is open. Such device shall not prevent rotation of the basket by hand.

(c) Every hydro-extractor shall be provided with a substantial lid, so equipped with such interlock or other approved device as will prevent the lid being opened while the basket is in motion, and prevent operation of the basket while the lid is open. Such device shall not prevent rotation of the basket by hand:

Provided that only sub-paragraph (a) of this paragraph shall apply to small enclosed bowl-type separators used for cleaning oil, separation of liquids, and works of such nature or similar small machines.

### **34. Power presses.**

(1) In respect of presses, the provisions in this regulation relating to fencing and safety shall apply.

(2) In this regulation the following terms have the meanings hereby respectively assigned to them-

"power press" means a power driven machine for compressing, cutting or shaping metallic or non-metallic substances by pressing drawing or stamping, but does not include hammer or forging press, shearing machine, and cylinder or rotary printing press equipped with revolving printing or impressing cylinders mounted on horizontal shafts;

"punch press" means a power press equipped with a ram or slide and with dies for the purpose of bending, blanking, coining, curling, cutting, drawing, embossing, extruding, forming, perforating, piercing, punching, redrawing, reaming or trimming materials under great pressure;

"hydraulic press" means a press in which power is transmitted to the ram by hydrostatic pressure;

"platen press" means a printing press in which the paper or other material, supported on flat impressing surfaces, is forced against the printing surfaces which are supported on stationary flat beds.

#### **General provisions for power presses.**

(3) (a) Every press, other than a hydraulic press shall be equipped with effective braking device.

(b) Revolving or reciprocating parts on the sides of presses located within six feet and six inches of the floor or working level and not enclosed by the housing of the machine shall be fenced.

#### **Power and punch presses (Automatic and semi automatic feed)/**

(4) (a) Every automatic, semi automatic or mechanical fed power press or punch press equipped with dial feed, slide feed, hopper feed or automatic roll and strip feed, shall be provided with

(i) fixed enclosure of the ram, with the opening between the bottom of the enclosure and the work or working surface not exceeding a quarter of one inch and with the top of the enclosure extending at least as high as the upper limit of the ram; or

(ii) limitation of the ram stroke so that the clearance between the ram and the die or stripper does not exceed a quarter of one inch.

(b) The ram enclosure on power and punch presses shall-

(i) enclose the rear as well as the front and sides of the ram;

(ii) be of sheet metal, perforated or expanded metal, strong wire mesh, or non shatterable transparent material;

(iii) be so constructed as not to cause eye strain; and

(iv) have no opening as would enable any part of the hand to come within the trapping or nipping area.

#### **Power and punch presses (hand fed)**

(5) (a) Every hand fed power press and press brake shall be fenced by one of the following means-

(i) a static fixed guard at the front or feeding side and both sides of the ram to prevent access of the fingers of the operator to the danger zone; and the distance of the front of the static fixed guard from the ram, and the length and depth of the feed opening shall comply with the provisions of the Seventh Schedule;

(ii) an interlocked guard which prevents the ram from making a stroke unless the guard is in its protective position; and so fences the front and both sides of the ram as to prevent access of the fingers of the operator to the danger zone when the guard is in its protective position;

(iii) an operating device which requires the simultaneous action of both hands of the operator to operate the press; and so arranged that it cannot be operated by one hand and that it prevents access of the fingers of the operator to the danger zone before completion of the pressing stroke of the ram;

Provided that on pedal operated presses a device may be provided which requires both hands of the operator to release such a device before the foot pedal can be moved;

(iv) an automatic sweep guard, so arranged to sweep the operator's hand out of the danger zone as the ram descends, and a fixed guard on both sides of the ram so arranged that no "nipping" hazard can exist between the sweep guard and any fixed structure:

Provided that no protective device need be fitted to any hand fed power press where the stroke of the ram is such that the maximum possible clearance between the ram and the die or stripper is three-eighths of one inch or less.



(b) The Chief Inspector may, in his discretion, permit the use of means or types of guard other than those specified in sub-paragraph (a) above.

(c) Every foot pedal on every hand-fed press shall be so fenced that it cannot be accidentally struck.

(d) During the operation of setting the dies in the press, adequate means shall be provided to prevent the dropping of the ram; and the source of power shall be disconnected from the press and the press turned by hand until the correct alignment of the dies is obtained.

#### **Hydraulic presses.**

(6) (a) Every hydraulic press with down-stroking rams shall be provided with interlocking guard and means of positively supporting the ram when the guard is in the open position.

(b) Where the operating valves are not part of or attached to the frames of a hydraulic press-

(i) the valves shall be so located that the operator will have a clear and unobstructed view of the press when standing in the normal operating position; and

(ii) where the operation of the press is not plainly visible, a mirror affording full view of the press shall be installed in front of the operator.

#### **Clicking presses.**

(7) (a) Every clicking press using fixed dies shall be provided with one of the means prescribed in paragraph (5) (a).

(b) The platen stroke of every clicking press using hand dies shall be adjusted so that the platen will not come closer than three inches to the table.

(c) hand dies shall not be less than three inches in height and shall be provided with a handle or safety flanges.

#### **Garment presses.**

(8) Every garment press shall be fenced by an operating device which requires the removal of both hands of the operator from the danger zone until the press is closed.

#### **Platen presses.**

(9) (a) Every platen press and other platen type machine shall be equipped with-

(i) an automatic feeding device; or

(ii) an automatic safety stop which will prevent the platen from closing if there is any obstruction between the platen and the bed.

(b) No hand-fed platen press shall be operated at a speed in excess of thirty-five impressions per minute.

#### **Baling presses.**

(10) (a) In every baling press where the moving platform rises above floor level, it shall be provided with smooth aprons to prevent workers from getting caught between the floor and the press platform.

(b) The edges of the pit in which the platform moves shall be chamfered or otherwise guarded so as to prevent a person's foot from being trapped between the edge of the pit and the edge of the platform.

(c) Every baling press on which two workers are employed shall not be started up or down by one of the workers without a signal from the other, unless it is started up by a device requiring simultaneous action by both workers.

### **Brick and pipe machine.**

(11) (a) Every trough mixer shall be fenced by a substantially constructed guard, the largest opening of which measured parallel to the shaft shall not exceed one inch.

(b) Every feed-opening in every floor or platform shall be fenced.

(c) Every dry and semi-dry brick-making machine shall be fenced so as to prevent the hands and arms of the operator being trapped between the reciprocating feed box or top platen and the table or lower platen.

### **35. Guillotines.**

Every guillotine shall be fenced by-

(a) a starting device which requires the simultaneous action of both hands to start the cutting action and of at least one hand on a control during the complete stroke of the knife; or

(b) an automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with a one hand starting device, and so designed as to return positively to its starting position after each complete cycle of the knife; or

(c) a guard which will positively prevent the hands of the operator or any other person from entering the danger zone.

### **36. Rubber knives.**

Every knife of the circular revolving blade type used for cutting rubber shall be fenced.

### **37. Machine tools.**

(1) Every turret lathe and every machine in which the rotating stock bar extends beyond the end of the machine shall be fitted with tubular guards, substantially supported and enclosing the projecting stock bar.

(2) Chucks used for holding tools in drilling machines shall have no projecting parts.

(3) Drills, reamers and taps used in drilling machines shall be fenced where practicable.

(4) Suitable clamps, jigs or fixtures shall be provided for holding work pieces on vertical drilling machines.

(5) Every milling cutter mounted on horizontal arbors for external operation, shall be provided with a strong guard of suitable material:

(a) enclosing the cutting surface, except the part necessarily exposed for the milling operation, and extending on each side of the cutter to the ends of the arbor or to the arbor supports; or

(b) enclosing the cutter completely but opening automatically to a sufficient extent to permit the cut to be made as the work approaches the cutter.

(6) Every head of every vertical milling cutter shall be fenced.

### **38. Tea rollers.**

(1) Every eccentric motion crankshaft of every tea roller shall be fenced so that the points of shear between the crankshaft webs and the bearings cannot be reached.

(2) Every tea rolling machine shall be-

(a) so arranged that there shall be no crushing points between the scraper ring and the edge of the rolling table; or

(b) so fenced that the operator cannot reach the rolling table.

### **39. Bottle filling and capping machinery.**

(1) Every glass bottle or syphon filling machine working under pressure shall be fenced by a sheet or mesh guard, the maximum dimension in any opening of which shall not exceed one quarter of one inch; and the guard shall be so arranged as to prevent effectively any person being struck by pieces of broken glass.

(2) Every glass bottle corking or capping machine shall be provided with a table or other device for supporting the bottle during the corking or capping operation; and a substantial metal screen shall be placed between the machine and the operator; and such screen shall be so constructed as to prevent effectively any person being struck by pieces of broken glass.

### **40. Conveyor machinery.**

(1) In respect of conveyor machinery, the following general provisions relating to fencing and safety shall apply-

(a) Every conveyor machinery shall be so constructed and installed as to avoid hazardous points of shear between moving and stationary parts or objects.

(b) Where frequent access is required to a conveyor machinery, the floor in which the conveyor machinery is located shall be provided with a foot walk or cat walk along the entire length, and such foot walk or cat walk shall not be less than eighteen inches in width and equipped with guard rails and toe-boards:

Provided that the provisions of this sub-paragraph need not apply with respect to portable conveyors used in the open at ground level in or near quarry or mine faces for the purpose of conveying metal or other mined material.

(c) Where a conveyor, which is not entirely enclosed is located in pits or at floor level, any floor opening shall be guarded by guard rails and toe boards.

(d) Every enclosed conveyor used for carrying combustible materials of an explosive nature shall be provided with safety relief vents leading as directly as possible to the outside air and not connected with any chimneys, pipes, vents or flues used for any other purpose.

(e) Every power driven conveyor shall be provided at its loading and unloading stations, at its drive and take up ends, and at other frequent and convenient places, with devices for stopping the conveyor machinery in the case of an emergency.

(f) Every conveyor which carries loads up inclines shall be provided with mechanical devices that will prevent the machinery from reversing and carrying the loads back towards the loading point in the event of the power being cut off.

(g) Where material is loaded on moving conveyors by hand, the speed of the conveyors shall be slow enough to allow loaders sufficient time to place the material in position without losing their balance, and in such a manner that the material will not project to a dangerous extent over the sides of the conveyors or be likely to fall.

(h) Where a conveyor extends to points not visible from the control stations, it shall be equipped with warning signals to be used by operators before starting the machinery so as to warn persons who may be within the danger zone.

#### **Chute gravity conveyor.**

(2) On every chute gravity conveyor, where heavy articles are transported and cannot be plainly seen in their descent, there shall be provided at the delivery end a device to give warning that a package is about to be delivered.

#### **Belt conveyor.**

(3) Every belt conveyor shall be fenced by a guard at each nip-point and such guard shall extend not less than three feet from such nip-point; and where materials which are liable to stick to the drum are carried, fixed scrapers or brushes shall be fitted.

#### **Chain conveyor.**

(4) (a) Every overhead chain conveyor shall be so installed that ample clearance is provided between the material transported and any fixed or moving object.

(b) Every apron conveyor used for carrying unpacked bottles, jars or other glass containers shall be provided with side rails at a suitable distance above the conveying surfaces to prevent the containers from tipping over or falling off.

(c) Every inclined bucket conveyor shall be enclosed with solid guards which-

(i) are not less than six feet and six inches in height, so as to prevent anything being pushed or thrown into the shaftways and to hold any material which might drop from the buckets; and

(ii) are provided with wire-glass windows or doors, or with removable sections to facilitate inspection, cleaning and repairs:

Provided that the provisions of this paragraph shall not apply to the main bucket conveyors fitted on booms, used in dredging or earth excavation works.

#### **Portable conveyors.**

(5) (a) Every portable conveyor shall be so designed as to minimise the danger of upsetting or overturning due to eccentric loading.

(b) Mechanisms for raising or lowering booms on portable conveyor shall be of the self-locking worm, jack-screw or other positive type.

#### **Screw conveyor.**

(6) (a) Every screw conveyor not of the totally enclosed type shall be placed in steel or steel-lined trough fitted with well secured tight covers of heavy wire mesh in removable sections so as to prevent any part of a person from coming into contact with the screw and where practicable, a corresponding top cover made of not less than 1/8" steel plate in removable sections shall be fitted.

(b) No person shall attempt to loosen material in clogged screw conveyors or to carry out any repair work on screw conveyors without first shutting off the power and locking the controls.

#### **41. Other machines.**

Every machine not specifically referred to in these regulations shall be fenced in such a manner as an Inspector shall require.

### **PART V DUTIES AND LIABILITIES**

(1) It shall be the duty of the occupier to comply with the provisions of these regulations and to ensure that they are observed provided that in the case of machinery used in common by the owner and the occupier these duties shall be the responsibility of both the owner and the occupier.

(2) It shall be the duty of the operator to make use of the fencing.

#### **42. Occupier's duty to comply.**

Any person who commits an offence against these Regulations for which no corresponding penalty is provided by the Act shall be liable to a fine not exceeding one thousand ringgit.

#### **43. Penalty.**

Any person who commits an offence against these Regulations for which no corresponding penalty is provided by the Act shall be liable to a fine not exceeding one thousand ringgit.

#### **44. Compoundable offences.**

The Chief Inspector or a Deputy Chief Inspector may compound offences involving the contravention of regulations 10, 14, 22, 23, 24, 25 and 25.

*[Ins. P.U. (A) 86/1978]*

## FIRST SCHEDULE

(Regulation 3)

### GUARDS

#### 1. GENERAL SPECIFICATION

(i) Guards shall be so designed, constructed and used that they will-

(a) provide positive protection;

(b) prevent access to the danger zone during operation;

(c) cause the operator no discomfort or inconvenience;

(d) withstand long use with minimum maintenance;

(e) resist normal wear and shock;

(f) not constitute a hazard by themselves, that is to say without splinters, sharp corners, rough edges, and other sources of accidents.

(ii) Every guard shall be securely fastened to the machine or to the floor, wall or ceiling and shall be kept in place whenever the machine is operating.

#### 2. FRAME-WORK FOR SMALL GUARDS

Minimum dimensions of materials for the frame-work of metal guards 30" or less in height and with a surface area not exceeding 10 square feet shall be 3/8" for solid rod 3/4 by 3/4 by 1/8 in. for angle iron.

Other construction of equal strength may be substituted for guards of the same areas as mentioned above.

#### 3. FRAME-WORK FOR BRACED GUARDS

(i) Minimum dimensions of materials for the frame-work of guards more than 30 in. in height and with a surface area exceeding 10 square feet shall be 1 by 1 by 1/8 in. for angle iron or 3/4 in. inside diameter for metal pipe.

(ii) Every guard shall be rigidly braced every 3 feet or fractional part of the height to some fixed part of machinery or building structure.

#### 4. FRAME-WORK FOR UNBRACED GUARDS.

(i) Minimum dimensions of materials for the frame-work for a guard when fastened to the floor or working platform without any support or bracing shall be-

(a) not less than 1 1/2 by 1 1/2 by 1/8 in. for angle iron;

(b) 1 1/2 in. diameter for metal pipe; or

(c) of other metal construction of equal strength.

(ii) Rectangular guards should have at least four upright frame members each of which shall be securely fastened to the floor.

(iii) Cylindrical guards should have at least three supporting members carried to the floor.

(iv) Joints of all frame-work shall be equivalent in strength to the materials of the frame.

## 5. HORIZONTAL OVERHEAD BELT GUARDS.

Frame-work of guards for horizontal overhead belts, ropes or chains situated more than 6 feet 6 inches above the floor or working platform if of angle iron, shall be at least-

- (a) 1 by 1 by 3/16 inch for belts up to 10 inches in width;
- (b) 1 1/2 by 1 1/2 by 1/4 inch for belts 10 to 14 inches in width;
- (c) 2 by 2 by 5/16 inch for belts 14 to 24 inches in width; and
- (d) 3 by 3 by 3/8 inch for belts over 24 inches in width.

Guard supports, if of flat iron shall be of the following dimensions-

- (a) 1 1/2 by 1/4 inch for belts up to 10 inches in width;
- (b) 2 by 5/16 inch for belts 10 to 14 inches in width;
- (c) 2 by 3/8 inch for belts 14 to 24 inches in width; and
- (d) 2 1/2 by 3/8 inch for belts over 24 inches in width.

Every guard shall be provided with adequate number of supports and attachments so as to ensure sufficient rigidity and resistance.

## 6. FILLING MATERIALS

(i) Fillers shall be made of solid sheet metal not less than 0.03 inch in thickness, perforated sheet metal not less than 0.04 inch in thickness, expanded metal not less than 0.05 in. in thickness, or woven wire not less than 0.06 inch in diameter.

(ii) Fillers of other materials of equal strength for the same areas may be substituted.

(iii) Where woven wire is used it shall be of the type in which the wires are securely fastened at every crosspoint by welding, soldering, or galvanising, except in the case of diamond or square wire mesh made of wire 0.08 inch in diameter, 3/4 inch mesh, or heavier.

## 7. FASTENINGS

Filler materials shall be securely fastened to angle-iron frame-work with rivets or bolts, by welding, or by weaving through the frames.

Filler material for pipe frames shall be made into panels with rolled edges or bound with sheet metal, and the panels shall be fastened to the frames with steel clips.

## 8. FILLER OPENINGS

Where guards or enclosures are within 4 inches from moving parts of machinery at all points, no mesh or opening shall be more than 1/4 inch in width, and where clearances are above 4 inches no mesh or opening should be more than 2 square inches in area.

## 9. "U" GUARDS.

"U" guards shall be constructed of material specified for fillers in paragraph 2 above and where necessary edges shall be reinforced by rolling or wiring or by binding with angle or flat metal.

## 10. WOOD GUARDS.

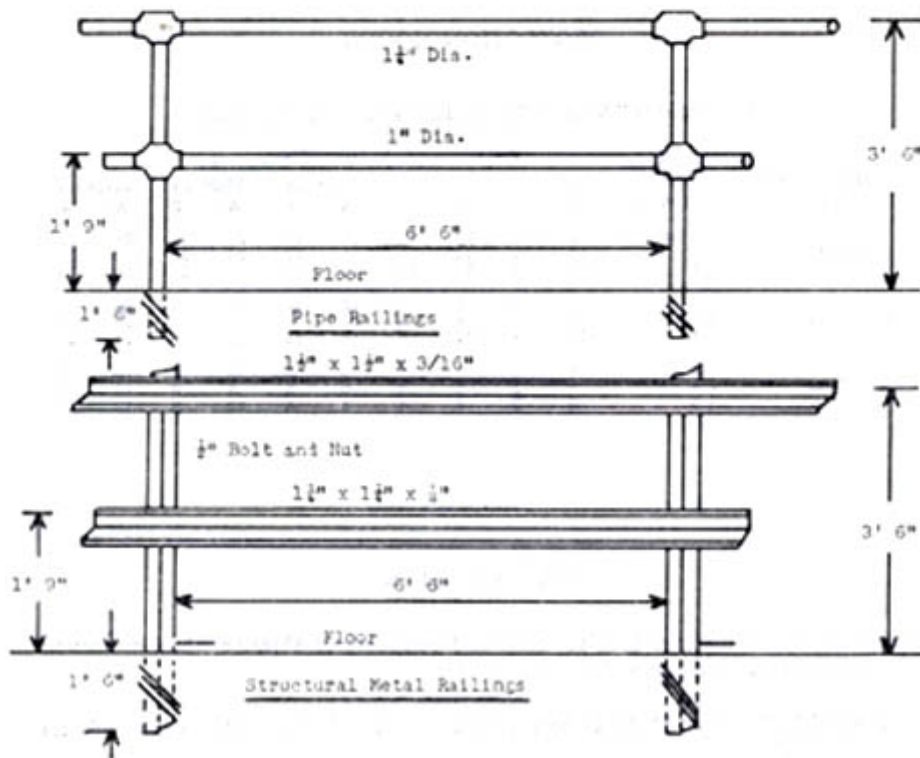
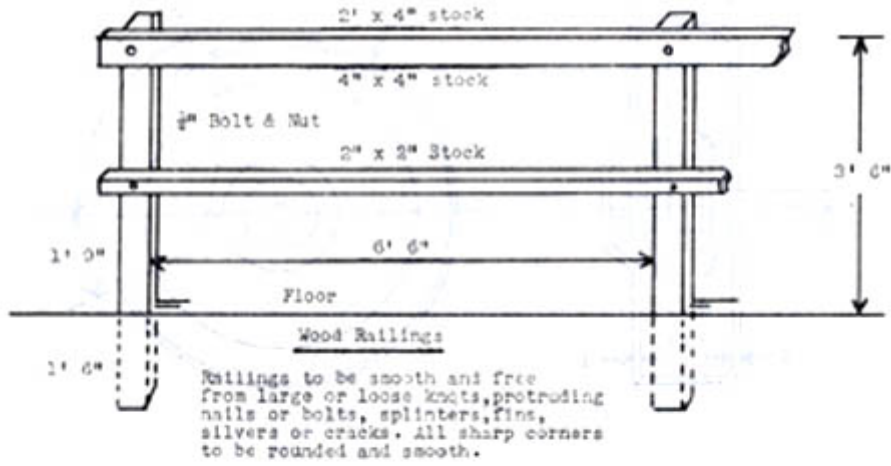
Where wood is used for guard material such wood shall be sound, tough and free from any loose knots and shall be made of planed lumber not less than 1 inch rough board measure or of plywood or fabricated products of equal strength, and all edges and corners shall be rounded off, and shall be securely fastened together with wood screws or hardwood dowel pins, bolts, rivets, or crimped nails, and shall be equal in rigidity to metal guards.



## SECOND SCHEDULE

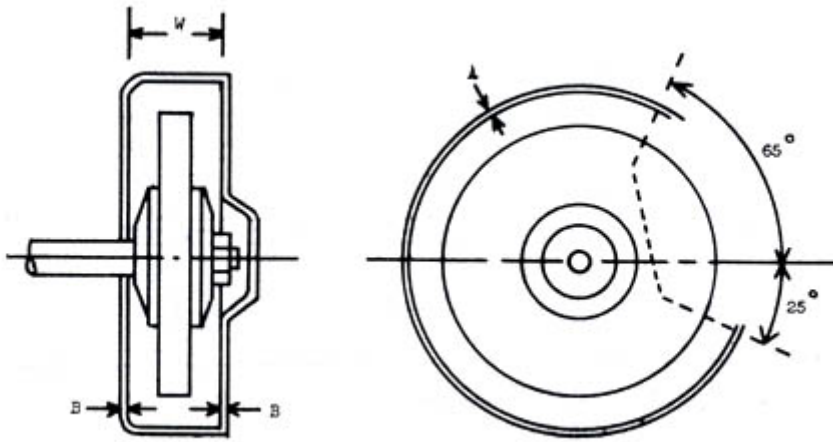
(Regulation 3)

### CONSTRUCTION OF RAILINGS



### THIRD SCHEDULE

(Regulation 22 (4) (a) (ii))



### PROTECTION HOODS

Dimensions "A" and "B" in Thirty-seconds of an Inch

Material used for Guard	Maximum Thickness of Wheel	ABRASIVE WHEEL DIAMETERS									
		3-6 ins		7-12 ins		13-16 ins		17-20 ins		21-24 ins	
		A	B	A	B	A	B	A	B	A	B
Cast Iron	2 ins	8	8	12	10	16	12	20	16	28	20
	4	10	10	12	10	16	12	24	20	32	20
	6	12	10	16	14	20	16	32	20	36	24
Cast Steel	2	8	8	8	8	12	12	16	14	20	16
	4	8	8	8	8	12	12	16	14	20	16
	6	12	8	12	8	16	12	20	16	24	20
Mild Steel	2	4	2	6	4	6	6	8	8	10	8
	4	4	2	6	4	6	6	8	8	10	8
	6	6	2	8	4	8	6	12	8	12	8

### SPECIFICATION

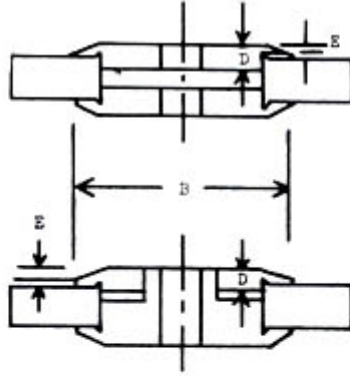
The thickness of material used for sides and periphery of abrasive wheel protection hoods to be in accordance with the above table.

The width of the hood "W" to be not less than one and one-half times the thickness of the wheel.

## FOURTH SCHEDULE

(Regulation 22 (4) (f))

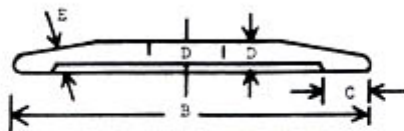
FLANGES FOR STRAIGHT SIDED ADAPTOR AND SLEEVE MOUNTED ABRASIVE WHEELS WHERE PROTECTION HOODS ARE FITTED



All Dimensions in Inches

Wheel Diameter	Hole Diameter	B Minimum Flange Diameter	D Minimum Thickness of Flange at Bore	F Minimum Thickness of Flange at Recess
12-12	4	6	5/8	3/8
12-14	5	7	5/8	3/8
12-14	6	8	5/8	3/8
14-18	4	6	5/8	3/8
14-18	5	7	5/8	3/8
14-18	6	8	5/8	3/8
14-18	7	9	5/8	3/8
14-18	8	10	5/8	3/8
18-24	6	8	3/4	1/2
18-24	7	9	3/4	1/2
18-24	8	10	3/4	1/2
18-24	10	12	3/4	1/2
18-24	12	14	3/4	1/2

FLANGES FOR STRAIGHT SIDED ABBOR MOUNTED ABRASIVE WHEELS WHERE PROTECTION HOODS ARE FITTED



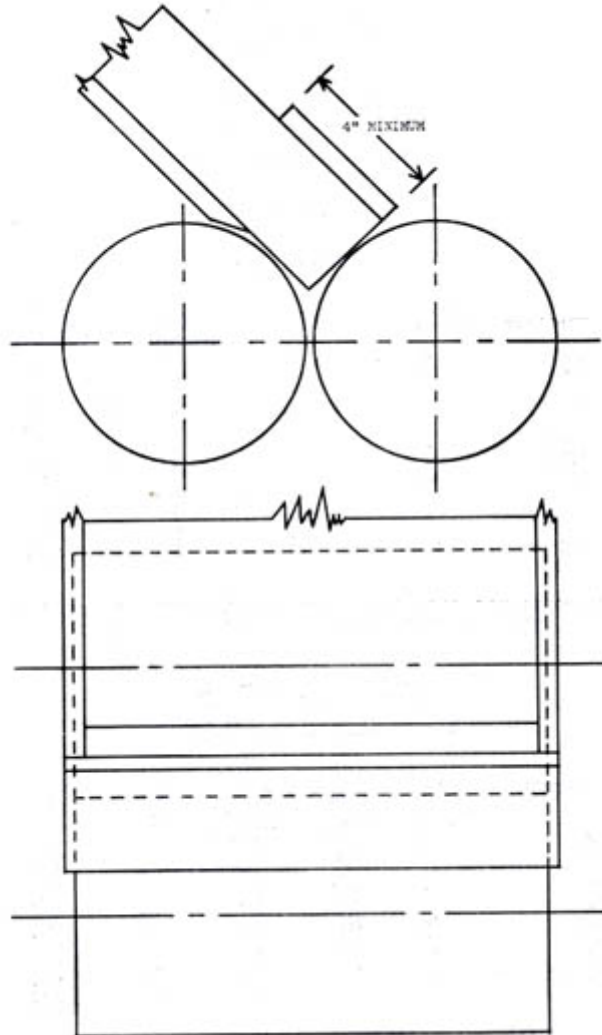
Diameter of Wheel	B Minimum Outside Diameter of Flange	C Radial Width of Bearing Surface		D Minimum Thickness of Flange at Bore	E Minimum Thickness of Flange at Recess
		Minimum	Maximum		
4	1 1/4	3/16	3/16	3/16	1/8
6	2	1/4	1/2	3/8	3/16
8	3	1/4	1/2	3/8	3/16
10	3 1/2	5/16	5/8	3/8	1/4
12	4	5/16	5/8	1/2	5/16
14	4 1/2	3/8	3/4	1/2	5/16
16	5 1/2	1/2	1	1/2	5/16
18	6	1/2	1	5/8	3/8
20	7	5/8	1 1/4	5/8	3/8
22	7 1/2	5/8	1 1/4	5/8	7/16
24	8	3/4	1 1/4	5/8	7/16

All Dimensions in Inches

**FIFTH SCHEDULE**

(Regulation 23 (6) (a) (i))

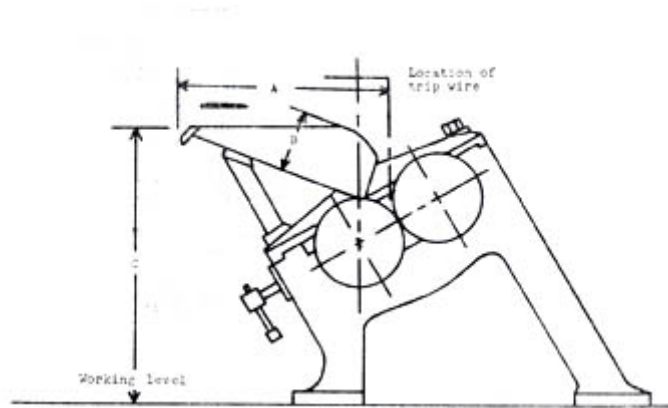
**BRIDGE GUARD FOR MEE ROLLERS**



## SIXTH SCHEDULE

(Regulation 23 (9) (a) (i))

### PLATFORM GUARD FOR HORIZONTAL TWO ROLL MILLS USED IN THE MANUFACTURE OF CREPE RUBBER



Section through centre line of oblique set of rolls.

Dimension "A" to be not less than 30 inches,

Dimension "C" to be not less than 39 inches,

Dimension "B" to be not less than 9 inches,

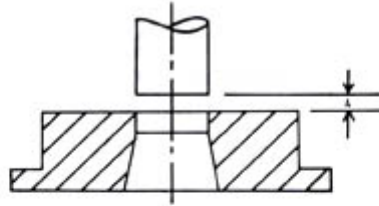
Dimension "A" & "C" may be varied by an inspector to suit conditions in any particular installation where adherence to the above is not practicable.

The platform guard is to be of metal not less than 1/8" thick, stiffened as necessary.

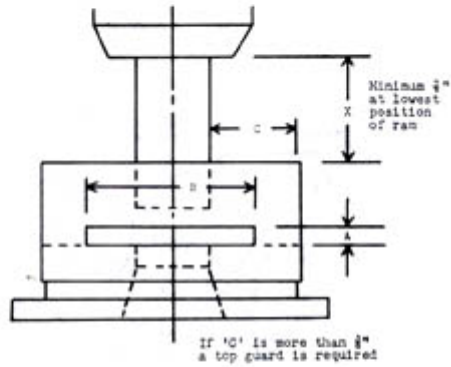
The provision of a chute to deliver the milled rubber to the front of the machine is advised.

## SEVENTH SCHEDULE

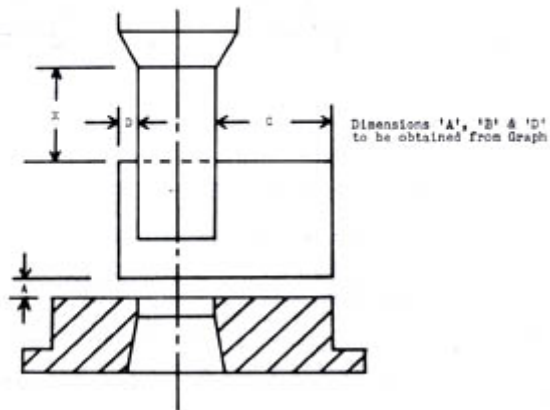
(Regulation 34 (5) (a) (i))



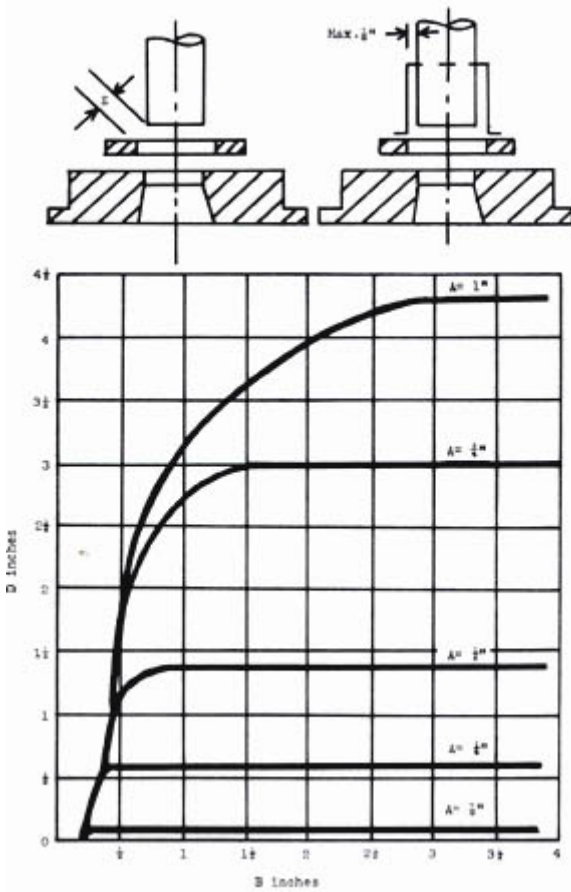
If 'A' does not exceed three eights of an inch a guard is not required



If 'C' is more than  $\frac{3}{8}$ " a top guard is required



WHERE FIXED EJECTOR PLATES ARE FITTED A GUARD NEED NOT BE PROVIDED UNLESS THE DISTANCE "E" EXCEED 3/16" IN WHICH CASE THE TOOL MUST BE PROVIDED WITH A GUARD AS SHOWN



The distances "A" & "B" are determined by the form and size of the work. The distance "D" can be determined by reference to the graph.

## LIST OF AMENDMENTS

*Particulars under section 7(ii) and (iii) of the Revision of Laws Act 1968 (Act 1)*

<b><i>Amending Law</i></b>	<b><i>Short title</i></b>	<b><i>In force from</i></b>
Act 160	Malaysian Currency (Ringgit) Act 1975	29-8-1975
PU(A) 86/1978	Factories and Machinery (Compoundable Offences) Regulations 1978	31-3-1978

## LIST OF LAWS OR PARTS THEREOF SUPERSEDED

<b><i>No.</i></b>	<b><i>Title</i></b>
P.U.(A) 10 of 1970	Factories and Machinery (Fencing of Machinery and Safety) Regulations 1970