

84.49

84.49 - Machinery for the manufacture or finishing of felt or nonwovens in the piece or in shapes, including machinery for making felt hats; blocks for making hats.

The heading covers machinery for the manufacture or finishing of all kinds of felt or nonwovens or of articles of felt or nonwovens, but **excluding** those for the manufacture of felted woven fabrics. The heading also covers blocks for making hats.

Machines used in the preliminary operations before felting (e.g., blower grading machines for sorting hair, textile openers, beaters and cards) are the same as those used in the preliminary operations for preparing fibres for spinning, and remain classified in heading 84.45.

(A) MACHINES FOR THE MANUFACTURE OR FINISHING OF FELT OR NONWOVENS IN GENERAL

This group includes :

- (1) **Felters**, generally composed of two heavy grooved plates, one fixed and the other capable of reciprocating movement, between which the web of carded fibres is submitted to friction and high pressure and becomes felted. These machines also include devices for moistening the web and heating the plates.

In certain types of these machines the plates are replaced by fluted rollers.
- (2) **Soaping machines** to soap the partially formed felt.
- (3) **Fulling mills**. In these the felt pieces, previously soaped, are pounded with hammers to complete the felting. Such mills remain here even though, exceptionally, they can be used for fulling small woven or knitted textile articles; on the other hand, rotary milling machines which are mainly used for fulling or felting woven fabrics are **excluded** (heading 84.51).
- (4) **Machines for the manufacture of reinforced felts**. The felt and a support of woollen fabric may be felted together by the action of a heated roller; or a series of barbed needles may be used to punch some of the fibres into a non-woollen base fabric prior to felting.
- (5) **Finishing machines for felts**, such as smoothing and polishing, shaving, etc.
- (6) **Machines for the manufacture of nonwovens** (such as those employing the dry process, wet process or direct spinning).

(B) MACHINERY FOR MAKING FELT HATS

This group includes :

- (1) **Machines for felting animal hair into hat-shapes.** They consist of a roller system feeding the hair to rotating brushes or revolving belts of card clothing, and these throw the hair on to revolving perforated metal cones (or gauze cones). A strong current of air sucks the hair to the surface of the cone forming a layer on its surface.
- (2) **Felting presses,** with grooved faces usually of wood, one or both of which are capable of reciprocating motion, between which the pre-formed hat-shape is felted.
- (3) **Roller presses** to complete the felting of the hat-shapes.
- (4) **Stretching machines** on which the conical hat-shape is further formed and the conical end rounded.
- (5) **Machines in which the brim is formed** by passing the edges through conical rollers.
- (6) **Polishing machines,** which remove outstanding hairs from the surface by means of pumice stone or abrasive cloth.
- (7) **Singeing machines** for burning off hairs from the surface of the hat-shape.
- (8) **Proofing machines** in which certain hat-shapes are soaked or sprayed with shellac or gelatin, and pressed between rollers.
- (9) **Blocking machines** in which the turning of the brim is completed, and the hat-shape is given its final form.
- (10) **Sand presses;** these press bags of hot sand against the inside of the hat-shape placed on a hollow former, thus restoring the surface of the felt disturbed by previous operations.
- (11) **Machines with revolving pads to give the felt a smooth shiny surface.**

Machines for making woollen felt hats are the same as those described above for making hats from other animal hair felts, except for the first hat-shape forming operation. In the case of wool, the layer of fibres from the carding machine is formed into a hat-shape by a device consisting of a revolving double conical block.

(C) BLOCKS FOR MAKING HATS

These may be of wood or metal (usually aluminium), and are used with certain of the above machines.

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Hat-stretching blocks used in hat fitting are also classified here. Machines for tracing head contours used in hat fitting are **excluded (heading 90.31)**.

PARTS

Subject to the general provisions regarding the classification of parts (see the General Explanatory Note to Section XVI), the heading also covers parts of the machines of this heading.

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The heading **does not cover** :

- (a) Calenders for compressing the bats of fibre before felting (**heading 84.20**).
- (b) Knitting machines used in the production of knitted headgear (berets, fezes, etc.) (**heading 84.47**).