A feeding device for use in multipresses for the production of sheets or boards of fibrous vegetable material by pressure between superimposed press plates. The sheet or board blank is pressed between flexible foraminous metallic sheets such as sheets of wire cloth which are individually stretched in frames and held in their stretched condition therein while being inserted between the press plates; the frames being each of such dimensions as to be located outside of the press plates so that pressure is not imposed on them and they receive a minimum of heat during the pressing operation and the flexible metallic sheets being secured in the frame only at the opposite ends of the frame.
FEEDING DEVICE FOR SHEET AND PLANULAR BLANKS IN MULTILAYER PRESSES

This invention relates to a feeding device for sheet or planular blanks in multilayer presses.

More particularly this invention relates to a feeding device in multilayer presses for the production of sheets or boards of cellulose or other vegetable fibrous material, comprising a plurality of superimposed and press plates between which the sheets or board blanks are fed and subsequently subjected to pressure and possible heat.

It is known, for the purpose of avoiding this object, to convey the blanks on pliable or flexible metallic sheets constituted by wire cloths, the finished sheets or boards being discharged whilst they are still positioned on the said wire cloths. As the sheets or boards are removed from the press the cloths are wound up on a roller device intended for the purpose or also withdrawn in some other way, e.g., into a rack lying adjacent to said press.

However the wire feeding system has since been replaced to a large extent by the so-called plate feed system, where the blanks are placed on conveying plates and then fed into the press. When the pressing operation has been completed the conveying plates are withdrawn from the press together with the finished sheets positioned thereto and into a rack designed for this purpose. The sheets are removed and the conveying plates then returned, by way of various different conveying means, to the feed side ready for the next working operation.

It is obvious that the plate feeding system has advantages, both concerning capacity and reliability. However, at the same time it has a plurality of annoying drawbacks. Thus the pressed sheets are obtained with uneven thickness due to large deviations in tolerance of the conveying plates. Great losses in heat are encountered when hot pressing is applied due to the conveying plates being heated for each working cycle and then becoming cooled on return to the press and the new charge. Deviations in tolerance have been particularly prominent when producing, e.g., fiber boards in the press. The wet, cold sheet blank is fed on a cold conveying plate between the press plates of the hot press, the press plates working at a temperature of between 200° and 250°C. and a specific compression pressure on the introduced fiber blank of an order of magnitude between 50 and 100 kgs./cm.². Due to the constantly increasing demand on the capacity of hot presses, said presses are closed all the more rapidly, and consequently the full specific compression pressure is reached before it is possible for the plate to be heated to the final pressing temperature.

Due to the high degree of friction between the press plate and the fiber sheet the conveying plate cannot expand and consequently during the continuous heating process is compressed in such a way that, subsequent to a certain number of pressing operations, it becomes increasingly thicker towards its center portion.

This fact, together with the fact that manufacture of conveying plates with fully acceptable thickness tolerances incurs extremely high costs, has resulted in that within the fiber board industry one must be satisfied with relatively large tolerance limits, which is an obvious drawback particularly as the produced products must be capable of competing with other sheet material not encumbered with such variations in size.

The wire cloth feeding system is not encumbered with corresponding large thickness tolerances of the final product. On the other hand, wire cloth feeding systems known hitherto have either low capacity and large wear and tear, or require too complicated feed and discharge means, resulting in the plate feeding system, despite its obvious drawbacks, being used to an overwhelming degree.

It is one main object of the invention to provide a feeding device which has the advantages of the two systems, namely the capacity and reliability of the plate feeding systems, and the favorable thickness tolerances and low heat consumption of the wire cloth feeding system; at the same time avoiding their drawbacks.

Another object of the invention is to provide a feeding device reducing the heat the requirements of mechanical strength of the conveying means on which the blanks are introduced between the press plates and the pressed articles removed from the press.

A further object of the invention is to provide a feeding device which permits to retain the conveying means of the plate feeding system are retained in their entirety, i.e., with respect to loading racks, pushing means, discharge racks, withdrawal means and return conveyors with supporting and loading means for the material.

Further objects and advantages of the invention will become apparent from the following description considered in connection with the accompanying drawings which form part of this specification, and of which:

FIG. 1 is a plan view of a conveyor means designed according to the invention.

FIG. 2 is a partial side view of a multipress together with a side view of a transport means entered into said press, with portions cut away in vertical section.

FIG. 3 is a sectional view along the line III—III of FIG. 2.

FIG. 4 shows a similar section as that in FIG. 3 according to a somewhat modified form of the invention.

According to the invention the conveying means is provided with a rectangular elongated frame, generally indicated by the reference numeral 10, in which a wire cloth piece 12 is held stretched. The frame 10 is composed of two frame pieces 14 forming the two long sides of the same, said frame pieces 14 being securely connected at the ends with shorter crosspieces 16, 18. The frame pieces 14 can be constituted of flattened tubing, as is particularly evident from FIG. 3 and 4, whereas the crosspieces 16, 18 have enlarged cross-sectional dimensions and are possibly composed of two or more portions. Strip formed elements 20 which fit the inner cross section of the tube 14 which are inserted in said tube are rigidly connected to the lower face of the crosspieces. The wire cloth piece 12 is secured in the frame 10 at the short sides only, for which purpose the striplike crosspieces 16, 18 can be provided with transversal slots 22. The end portion of the wire cloth piece 12 is passed through said slots in the form of a loop 24 into which is inserted a rod 26 which locks the loop so that it cannot leave the slots 22. The long sides of the rectangular wire cloth piece 12 are suitably free in relation to the frame pieces 14. The wire cloth piece is stretched to the required degree by means of the crosspieces 16, 18 before their telescoped striplike elements 20 are fastened to the ends of the crosspieces 14. A setcrew 14a may be used to hold the elements 20 in the required cloth-stretching position as shown in FIG. 2.

Referring now to FIGS. 2 and 3 two press plates are indicated by the reference numerals 29 and 30. The upper plate supports a so-called polishing plate or press plate 32 by means of retainer members 33 to 36. A wire cloth piece 38 can be positioned, in a manner known per se, between said polishing plate and the upper press plate 30. According to FIG. 3 the lower press plate 28 is provided at both its long edges with chamfers 40 which fit the frame pieces 14. At the same time the crosspieces 16 and 18 are located outside the press in the working position of the conveying means between the press plates. This involves that the frame 10 in its entirety is located outside the surface 42 in the lower press plate 28 against which pressing of the blank 44 is effected. Consequently, the frame is only heated to a low degree by the press plate.

In the embodiment shown in FIG. 4, the lower press plate 28 is provided with brackets 46 in the form of an angle iron of which one is retained at each longitudinal side end wall of the press plate by means of screws 48. Thus the frame in this embodiment is also located entirely outside the press surface 42 of the press plate 28.

According to a modified embodiment of the invention the wire cloth piece 12 can be replaced by a thin foraminous carrier metal sheet. Such carrier sheet is so thin as to be pliable or flexible and thus lacking inherent rigidity.
The conveying means resting on a support is passed between the separated press plates 28, 30 after the fiber blank has been placed on the layer 12 by subjecting the crosspiece 16 to a force acting in the direction of the arrow 50, by means of a suitable traction means (not shown). Subsequent to the pressing operation the conveying means is withdrawn by applying a traction force to the crosspiece 18 in the direction of the arrow 52. The frame only requires sufficient rigidity to retain the layer 12, with the sheet of wet fiber pulp mounted thereon, stretched during insertion of the conveying means into the press. The tube piece 14 of the long sides has thus sufficient buckling resistance to withstand the stresses occurring in conjunction therewith. Consequently, the frame need not necessarily be so strong that it can support the layer 12 together with the wet pulp blank positioned thereon if the frame, e.g., is supported on its short crosspieces 16, 18. The conveying means may thereby be given a relatively low weight.

While several embodiments of the invention have been shown and described it is to be understood that this is for purpose of illustration only, and that the invention is not to be limited thereby, but its scope is to be determined by the attached claims.

What is claimed is:

1. A feeding device for use in multipresses for producing boards or sheets of fibrous vegetable material comprising, a plurality of superimposed press sheets between which the sheet or board blank is fed on flexible metallic sheets and subjected to pressure and heat between the plates, each of the metallic sheets being carried in and stretched on a frame, the metallic sheets in the frames being each connected to the frame only at opposite ends of the frame and being free of connection to the frame at its side edges, one of the ends of the frame being adjustable toward or away from the opposite end thereof to effect stretching action of the metallic sheet, the frame being of greater size than the size of the effective pressure surfaces of the press plates so that when one of the frames and its metallic sheet are disposed in pressing position, the frame will be disposed beyond the pressing surfaces and hence will receive no pressure therefrom and a minimum of heat.

2. A feeding device according to claim 1, wherein a lower pressing plate has a depressed area adjacent to its periphery and beyond its pressing surface, such depressed area providing a supporting shelf for parts of the frame so that such frame parts are not subjected to pressure from the press plates.