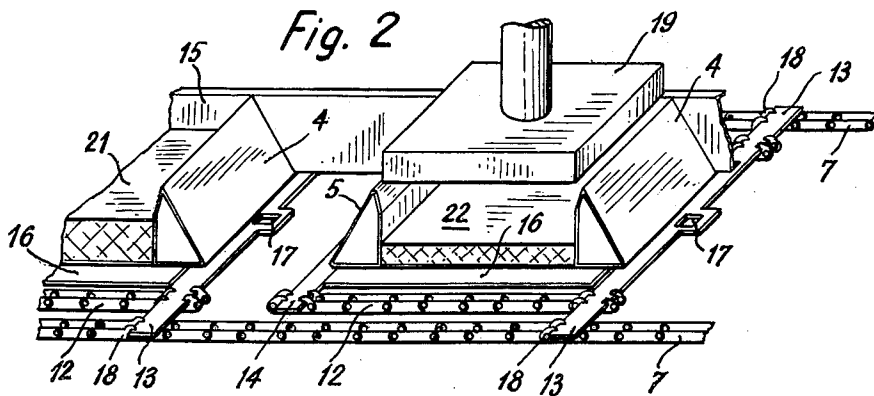
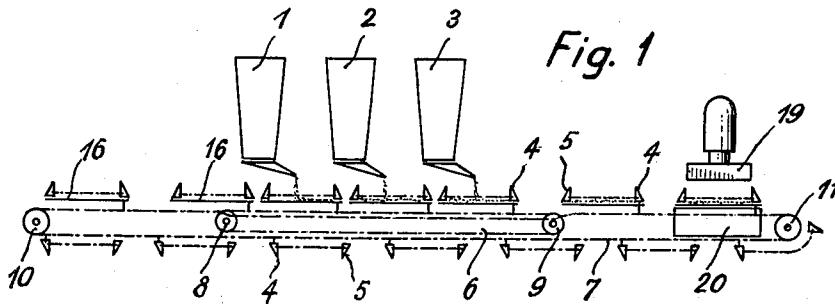


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 MOULDING LINE FOR MOULDING LOOSE PARTICLE MATERIAL
 INTO PRELIMINARY BLANKS DESTINED TO BE PRESSED
 IN A MULTIPLE TIER PRESS
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MOULDING LINE FOR MOULDING LOOSE PARTICLE MATERIAL INTO PRELIMINARY BLANKS DESTINED TO BE PRESSED IN A MULTIPLE TIER PRESS

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7 Claims. (Cl. 18-4)

The object of this invention is a moulding line, and particularly a moulding line for moulding loose particle material into preliminary blanks for panels destined to be pressed in a press, and particularly in a multiple tier press.

The moulding line comprises at least one material feeding point having cauls or pressing plates moving beneath it. Two fixed parallel side walls limit the width of the panel blanks, while two transverse walls limit the length of the blanks, the transverse walls being moved along between the side walls by driving means. The blanks moulded in the moulding line can, for instance, be composed of coarser and/or finer (shavings, flakes, etc.) wood particles in order to be pressed to form single (homogeneous) or multiple layer (non-homogeneous) wood particle panels.

The installations of this type which have already been proposed, as well as the moulding lines which are already in operation, are all based on the idea of connecting all the transverse walls, which two by two form pairs of transverse walls, somewhere near their middle to an endless driving chain. This chain runs over a plurality of sprocket wheels mounted on horizontal axes. A front transverse wall and a rear transverse wall together form a pair of transverse walls which together with a pressing plate momentarily cooperating with it and the two immobile side walls constitutes a filling mould.

The present system above, however, offers considerable disadvantage in being rigid, compared to the rigid filling frames proper which now have long been in use. The intervals between successive pairs of transverse walls must of necessity remain unchanged. Unchanged at least as long as the distance between the transverse walls of a pair remain constant, i.e., as long as partially or completely filled blanks remain between the transverse walls. In such a moulding line it would therefore be impossible to accelerate a pair of transverse walls in relation to the next following pair of transverse walls. At any particular moment the speed of all the pairs of transverse walls is exactly the same; this speed being determined by the momentary running speed of the chain driving these transverse walls.

The purpose of this invention is to provide a moulding line in which there is no longer any connection between and all driving means the transverse walls resulting in the often undesirable interdependence of the pairs of transverse walls. In the moulding line according to this invention, this problem is solved in that the front and rear transverse walls are connected in pairs by connecting means which are independent of the driving means in such a fashion that the distance between the transverse walls of each pair remains constant while it is running through the moulding line, and in the fact that means are also provided for establishing a positive connection between one transverse wall of each pair and the said driving means.

The invention also comprises an apparatus making use of the novel moulding line, for moulding loose particle material into preliminary blanks destined to be pressed in single or multiple tier press. According to this apparatus, the pairs of transverse walls are run past under the particle feeding point by means of a chain driving system, and are then passed on to another chain driving system which brings them at an increased speed to the

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preliminary press. The chain driving system which takes over the pairs of transverse walls is then periodically stopped during each preliminary pressing operation so that the areas is able to compress the particles filled in between the side walls and a pair of transverse walls.

With the foregoing and other objects in view as will appear from a reading of the following specification and claims, the invention resides in the novel arrangement and combination of parts and in the details of construction and process of manufacture hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention. It will be further understood that the invention is susceptible of embodiment in many and various forms, some of which are illustrated in the accompanying drawing, and that the structural details herein set forth may be varied to suit particular purposes and still remain within the inventive concept.

An embodiment of the moulding line according to the invention and of the process is described in detail in the following with reference to the drawing.

FIG. 1 shows a schematic side view of the moulding line.

FIG. 2 shows a perspective view of a section of the moulding line comprising the preliminary press.

As may be seen in FIG. 1, the particles are fed through one, two or three feeding points, of which for instance the first and last feeding points 1 and 3, cause fine flat wood shavings, flakes, etc. destined to form the covering layers, to flow into the filling spaces limited, in each case in the direction of motion of a chain drive 6, by a front transverse wall 4 and by a rear transverse wall 5. A feeding point 2 delivers preferably coarser wood particles which compose the intermediate layer or core of the blanks.

The blanks thus formed result, after they have been subjected to pressure and heat in a press, in triple layer, wood shavings faced, panels with smooth continuous covering layers and a porous intermediate layer. The principle of the process for the manufacture of such panels has already been disclosed in Fahrni's United States Patent No. 2,686,143, the assignee of the present invention.

It is obvious that any means for moistening the covering layer shavings could be provided for at and/or after the feeding points. The invention is independent of the number of feeding points or type or types of material fed. In the simplest case, a single feeding point would be sufficient for the manufacture of a single layer panel. The feeding points preferably operate in an intermittent manner. The feeding operation can be controlled directly by the transverse walls or by the driving brackets described below.

The moulding line is provided with two independent chain driving systems. The driving system indicated by 6 comprises a chain running over the rollers 8 and 9, which serves to cause the pairs of transverse walls together with the cauls, pressing or holding plates or sheets 16 to run past at a uniform speed under the feeding points 1, 2 and 3. An essential point is the provision of a further chain driving system 7 having the end rollers 10 and 11.

The chains 7 can be seen in detail in FIG. 2. In this figure may also be seen that, according to the invention, each front transverse wall 4 is permanently coupled with the corresponding rear transverse wall so as to form a unit. The connection is effected by means of connecting chains 12, the ends of which are secured to driving members in the shape of strips or brackets 13 and 14. Each transverse wall is of course welded to the central part of the corresponding driving members 13 and 14.

Owing to the fixed lateral walls 15 which extend practically along the whole length of the moulding line (one wall being left out in FIG. 2 for greater clarity), a space

for filling in the wood particles is defined in an exact manner between the transverse walls 4 and 5, this space being limited at the bottom by the pressing plate abutting against the driving member 14.

The driving member 13 are provided in the middle with an opening 17. In the region in which the chain 6 is active, fingers secured to the chain 6 enter the apertures 17 and move the pairs of transverse walls and the pressing plates forward in a uniform manner under the feeding points 1, 2 and 3. In FIG. 2 may be seen that the bracket shaped driving members 13 which are moved along by projecting fingers 18 on the chains 7, as well as the plate driving members 14, extend on both sides below the side walls 15. Likewise, the pressing plates must also naturally extend beyond the side walls.

The driving members 13 and 14 are preferably flat and no thicker than the pressing plates. Owing to the fact that the chains 7 and 12 are placed on the outside of the side walls 15, there is a possibility, which is highly advantageous, of effecting a preliminary pressing of the filled-in material at a point along the moulding line. Only the piston 19 of the press is clearly indicated in the drawing, whereas the press table 20 is only indicated schematically in FIG. 1. It is not necessary to mention in detail that suitable slipways or rollers are naturally provided in the usual way for supporting the chains 6 and 7, and in addition, for transporting the pressing plates.

The operation of the moulding line which has been described in its constructive aspects is as follows:

Pressing plates are furnished to the chain driving system 7 in any suitable way, for instance by sliding them in sideways, so that the pressing plates' rear edges abut against the front narrow edges of the driving members 14 and the plates come to lie beneath the transverse walls 4 and 5. Owing to the fact that the transverse walls are not connected in any way to the side walls 15, they may be moved forward together with the pressing plates. For this purpose, the projecting fingers 18 cooperate with the driving members 13. At a point situated near the rollers 8 the chains are led downwards in such a fashion that the positive connection between the driving members 13 and the projecting fingers 18 is disengaged. The units comprising a pair of transverse walls and a pressing plate are then taken over by a chain 6 (not shown in FIG. 2) running at a uniform speed, and which moves the transverse wall units forward by means of projecting fingers engaged in the openings 17. During this phase of the motion, the feeding operation is effected and preferably three or less layers of wood particles are filled in one over the other.

After the blank 21, which is still in a loose state has been formed, the units are again taken over by the system of chains 7. This occurs when the projecting fingers on chain 6 which are engaged in the openings 17 of the plates are lowered in consequence of the chain 6 running around the roller, and the projecting fingers 18 become effective again owing to the rise in height of the chains 7.

The transverse wall units are then brought to the preliminary press with an increased speed and there each one is stopped during the preliminary pressing operation. As a result of the fact that the units are accelerated when passing from one driving system to the other and subsequently run at an increased speed, it is possible, by suitably choosing the intervals, to save sufficient time to carry out the preliminary pressing operation. After the preliminary pressing operation in the press 19 and 20, the transverse walls move off around the deviating roller 11; the pressing plates carrying the preliminarily pressed moulding blanks 22 can then, for instance, be taken over by a line of rollers to slide the blanks into a series of single opening presses, or preferably a multiple tier press, by means of conventional devices.

After the hot pressing (or cold pressing) operation the pressing plates 16, having eventually been previously

cooled, are brought back to the beginning of the chain driving system 7. It is advantageous to cause the transverse walls 4 and 5 of each pair to be locked correctly in position in the preliminary press by suitable means (not shown), which may eventually be controlled by the press piston 19 itself, as long as the blank formed by the particles is subjected to pressure. The chains 12 are thus not subjected to any excessive stresses during the pressing operation and therefore have a longer life. In addition, if preferred, the side walls 15 may be widened for a few millimeters to increase the distance between the side walls slightly after each pressing operation in order to prevent any sideways jamming of the preliminarily pressed moulding blanks 22 when they are moved along out of the press.

The invention is not limited to the embodiment shown. For instance, it would be possible to replace the driving system 6 running at a uniform speed, by a driving system having a step by step drive, which would allow a relatively large number of layers of wood particles to be filled in one above the other by means of very few feeding points. This arrangement would appear to be particularly suitable in the case of installations of smaller capacity. It would also obviously be possible to provide more than two driving systems. A feature of the first importance is the combination of the pairs of transverse walls to form units which are no longer interdependent as they were in former moulding lines. It is also possible to replace the chains 12 by pressure stressed coupling means arranged between the driving means 13 and 14, such as, for example, rods provided with toggle joints. The transverse wall units would then be suitably pushed along by appropriate driving members 14 instead of being pulled along.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A moulding line for moulding loose particle material into preliminary blanks to be pressed in a multiple tier press, said line comprising at its initial stage at least one material feeding point, a press at a subsequent stage, pressing plates adapted to move to said press, two fixed parallel side walls to limit the width of said blanks, and front and rear transverse walls limiting the length of said blanks, means to support said plates and said side walls, driving means for moving said transverse walls along between the side walls from said material feeding point to said press, said front and rear transverse walls connected in pair by flexible connecting means, independent of the driving means, in such a fashion that the distance between the transverse walls of each pair remains constant while it is passed through the moulding line, but easily changeable while in operative, and releasable means provided for establishing a positive connection between one transverse wall of each pair of transverse walls and the said driving means.

2. A moulding line according to claim 1, in which the connecting means between the front and rear transverse walls are formed by flexible traction connections, and said releasable means for establishing a positive connection is between the front transverse wall of each pair of transverse walls and the said driving means.

3. A moulding line according to claim 2 wherein flat driving brackets are provided on both sides of said transverse walls wherein as the moulding line is run project outwardly beyond and below the side walls, and said flexible traction connections consist of chains arranged on both sides outside the side walls between the driving brackets of the front and rear transverse walls, said flexible traction connections being fixed in length during operating conditions, but changeable while inoperative to accommodate blanks of different lengths.

4. A moulding line according to claim 2, in which said driving means comprises a first and a second chain driving system, said chain driving systems being independent of one another, said releasable means establishing and

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interrupting the positive connection between the front transverse walls and the chain driving systems at predetermined points and moving the pressing plates along the moulding line.

5. Apparatus for producing prepressed particle board blanks, comprising at least one particle strewing device for forming loose mats, sheets for holding said loose mats, a preliminary press for converting the loose mats into prepressed blanks, a fixed support beneath the strewing device for supporting said sheets on which the mats are to be formed, two fixed parallel side walls to limit the width of said blanks, front and rear transverse walls movably disposed between the side walls in order to limit the length of said blanks, first driving means for moving said transverse walls below the strewing device, at an initial stage, second driving means for moving said transverse walls to said preliminary press at a subsequent stage, each front transverse wall being connected to the following rear transverse wall by means of a flexible traction connection independent of the driving means, and releasable engaging means on each of the said driving means for establishing a connection between the front transverse wall of each pair of transverse walls and each of the said driving means.

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6. Apparatus according to claim 4, comprising means for momentarily widening the side walls with respect to each other so as not to limit the blanks in the region of the preliminary press after each pressing operation.

7. Apparatus according to claim 5, characterized in that said side walls extend over said preliminary press, in that said second driving means consists of chains arranged laterally outside the preliminary press, and in that the front transverse walls are provided with flat driving members projecting outwardly beyond said side walls.

References Cited in the file of this patent

UNITED STATES PATENTS

15	2,335,790	Ransburg	Nov. 30, 1943
	2,619,681	Baker et al.	Dec. 2, 1952
	2,693,135	Frost	Nov. 2, 1954
	2,740,990	Miller et al.	Apr. 10, 1956
	2,769,728	Juvinall	Nov. 6, 1956
20	2,863,355	Ledingham et al.	Dec. 9, 1958
	2,878,728	Clark	Mar. 24, 1959
	2,923,030	Himmelheber et al.	Feb. 2, 1960
	2,986,263	Jones	May 30, 1961

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,070,838

January 1, 1963

Werner Hostettler

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, lines 51 and 52, for "easily chageable while in operative" read -- easily changeable while inoperative --.

Signed and sealed this 11th day of February 1964.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

EDWIN L. REYNOLDS

Acting Commissioner of Patents

