March 16, 1965 F. PAERELS ETAL 3,173,976

METHOD AND DEVICE FOR THE FORMATION AND TRANSPORT OF BLANKS, FORMED OF PARTICLES SUCH AS WOOD SHAVINGS, FIBRES AND THE LIKE DESTINED TO BE COMPRESSED TO BOARDS

Filed Oct. 24, 1961

Fig. 1.

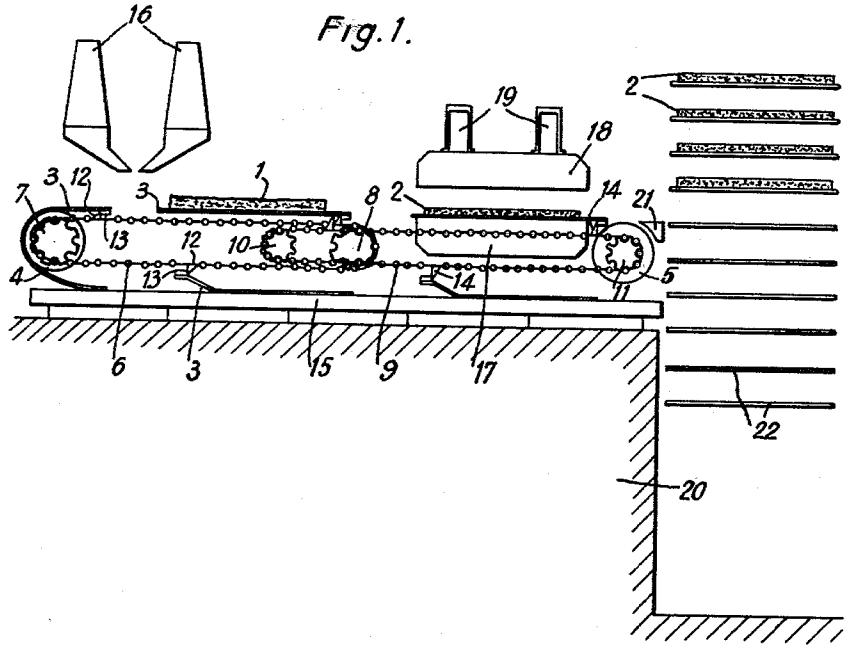
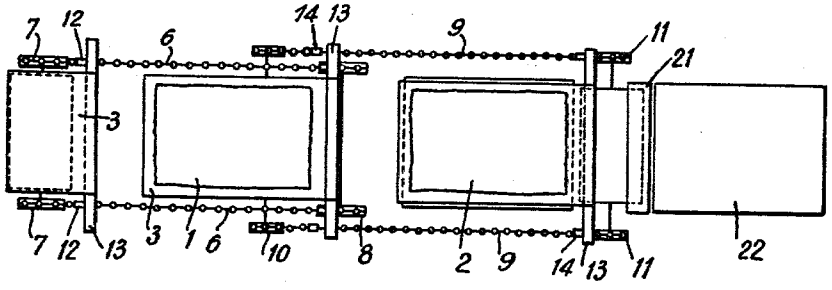


Fig. 2.



INVENTORS
FRANCISCUS PAERELS
WERNER ERNST HOSTETTLER
BY
James R. Heilman
ATTORNEY.

United States Patent Office

3,173,976

Patented Mar. 16, 1965

3,173,976

METHOD AND DEVICE FOR THE FORMATION AND TRANSPORT OF BLANKS, FORMED OF PARTICLES SUCH AS WOOD SHAVINGS, FIBRES AND THE LIKE DESTINED TO BE COMPRESSED TO BOARDS

Franciscus Paeres and Werner Ernst Hostettler, Zurich, Switzerland, assignors to Fred Fahrni, Zurich, Switzerland

Filed Oct. 24, 1961, Ser. No. 147,256
Claims priority, application Switzerland, Nov. 3, 1960, 12,320/60
5 Claims. (Cl. 264—109)

When forming blanks formed of wood shavings, fibres and the like destined to be compressed to boards, it has been usual up to now to cause so-called sheet metal pressing plates to pass under a scattering, pouring or felting station and thereafter to insert the pressing plates bearing the blanks—eventually after having pre-compressed the blanks—in a heated, preferably multi-layer press. When the pressing operation is terminated, the pressing plates must be extracted from the press, cooled down and then returned to the spot where the formation of the blanks takes place by special transport means, such as endless belts, a bank of rollers, etc. The so-called circulation of metal plates is complicated, requires expensive installations, occupies a considerable amount of space and on top of that also causes unpleasant noise. This is also true in the case of a proposal lately made known, to use the plates only for the formation of the blanks and to insert the blanks in the press after compression by means of a special press feeding frame, so that the compression in the press is effected without the plates.

It has already been tried to eliminate this disadvantage by scattering the particles on a moving endless belt so as to form individual blanks. Here the main difficulty lies in running the still completely loose blanks into the hot press without heaping them up or otherwise damaging them. When a single layer press is used, it is of course possible to run the endless belt directly through the press. This method is however unsuitable in the case of larger installations fitted with multi-layer presses. In addition it is unadvisable to expose the transport belt to the relatively high temperature in the press, and further the belt must be immobilized during each pressing operation and is therefore not available during that time for the relative displacement between scattering device and transport belt which the scattering operation requires. Naturally it would also be possible to run the transport belt serving as a scattering base through a preliminary press and thereafter to slip the precompressed blanks in the press by means of a suitable device. The well-tried preliminary presses generally used today, however, require the blanks to remain stationary in the press for a certain time, i.e., they operate discontinuously, as opposed to the modern scattering systems, in which blanks formed of several layers of particles are prepared by a single passage at uniform speed under several successive scattering stations. It is thus necessary, either to interrupt the scattering operation during the preliminary compression, or to delay the preliminary compression until a scattering operation is completed. This, however, is contrary to the increase in capacity of production generally called for today.

The aim of the invention which concerns, on the one hand a method, and on the other a device for the formation and transport of blanks formed of particles, such as wood shavings, fibres and the like destined to be compressed to boards, is to combine the advantages of the two described systems while eliminating the enumerated disadvantages. In the method according to the invention this problem is solved in that the particles are formed by

scattering or the like on at least one individual support made of flexible material moved forward along an elongated path, that the blanks which have been thus formed are taken over by a press feeding device, and that the support freed of the blanks is returned in a closed circuit to the spot where the formation of the blanks takes place.

The device for carrying out the new method is characterized according to the invention by at least one individual flexible support destined to take a blank formed on it, by transport means cooperating with the front side of the support and which extend from a particle distribution device towards a press feeding device and further by means for turning round and means for returning the support freed of the blank.

Owing to the use of one, but preferably of several individual and flexible supports, which can be made of cloth, rubber or the like for instance, it is now possible, by simply turning round the supports with the help of the same transport means to return them in a closed circuit to the particle distribution device, after the blanks have been taken over by a press feeding device. In the case of single layer presses the press feeding device can consist of a simple stop, which retains the blanks one at a time in the press, while the flexible support is withdrawn from the press on its rear side. It is particularly important to make it possible for several supports to be moved or kept stationary independently of one another. By providing correspondingly designed transport means it is possible for instance to keep one support stationary while at the same time moving other supports along the circuit path.

The drawing illustrates by way of an example an embodiment of the device according to the invention.

FIG. 1 shows a diagrammatic side view of an installation for forming pre-compressed wood shaving blanks.

FIG. 2 is a view from above of the installation according to FIG. 1, those parts which are situated above the still loose and the already pre-compressed blanks being left out.

A number of supports 3 made of flexible material on which the loose blanks 1 are formed by scattering are moved in a closed circuit and fitted with laterally projecting battens 13, which can be contacted by driving tappets on special transport chains in a manner which will be described.

The deflection of the flexible supports is effected by means of two rollers 4 and 5. A first transport chain 6, which for reasons of symmetry is doubled, runs over the sprocket wheels 7 and 8 and thus moves the supports 3 past below a scattering station 16 by means of tappets 12 secured to the chain. Two chains 9 are similarly provided in addition. The latter run over sprocket wheels 10 and 11, to which tappets 14 are secured. The chains 9 extend up to and over a preliminary press, comprising a press table 17, a stamp 18 and the hydraulically operated rams 19. The precompressed blanks leaving the preliminary press are indicated by the numeral 2.

A table 15 rests on a foundation 20. The pressing cloths rest on this table during their return journey. It is of course necessary to provide a grid or the like between the deflecting drum 4 and the press table 17 and on which the flexible supports rest during the scattering operation and during the transport of the blanks to the preliminary press. This grid has been omitted in the drawing for greater clarity, as have the guiding means on which the battens 13 run during the return motion, that is as long as they are moved along by the lower sides of the chains 6 and 9 by means of the tappets 14 and 12.

The preliminary press 17, 18 is followed by a press feeding device. This is composed of a number of feeding plates 22 made of rigid material which can be raised and

lowered simultaneously, and by means of which the pre-compressed blanks 2 are pushed in a known manner into a ten layer press, which has not been shown, in a single operation. After they have been inserted, the pre-compressed blanks 2 are retained in the open hot press and the feeding plates 22 are withdrawn from the latter.

An intermediate member 21 is provided between the drum 5 and the feeding frame. It prevents the pre-compressed blank breaking up during its passage from the support 2 on to the feeding plate 22. The friction between the intermediate member 21 and the pre-compressed blanks sliding over it is conveniently reduced by means of an air cushion. For this purpose the intermediate member may be made hollow and be provided with openings in the surface turned towards the pre-compressed blanks 2. The intermediate member has then to be connected to a compressed air line, so that air at a suitable pressure may flow out through the said openings and cause the pre-compressed blanks 2 to be lifted slightly.

The operation of the device the construction of which has just been discussed is as follows:

To begin with the flexible supports are moved past at a uniform speed under the scattering station 16. This motion is forced owing to the fact that the chain 6 runs at constant speed and that the tappets 12 engage the battens 13. Opposed to this the chain transporter 9 operates intermittently. The supports 3 each bearing a blank 1 are taken over by the tappets 14 and moved at an accelerated speed into the preliminary press 17, 18.

During the preliminary pressing operation the transporter 9 is brought to a standstill. In the representation of FIG. 1, a tappet 14 is just in the act of taking over from a tappet 12. This is effectively possible because of the higher speed of the tappets 14 compared to that of the tappets 12. After the preliminary pressing operation the supports 3 together with the precompressed blanks 2 resting on them are drawn out of the preliminary press 17, 18. The support 3 is deflected over the roller 5, and the pre-compressed blank 2 continues to move straight on and runs over the intermediate member 21 onto the feeding plate 22. During this time a succeeding blank 1 is inserted in the preliminary press. After a pre-compressed blank 2 has been inserted in the feeding frame, the latter is raised by one step and is thus ready to receive the next pre-compressed blank.

It is recommended to provide fixed side walls in the region of the first chain 6, in order to guide the blanks 1 and to facilitate the scattering operation. In addition the blanks could be limited by means of transversal walls moved along between the fixed side walls and permanently secured to the chain transporter 6 so that they are deflected before the blanks together with the flexible supports 3 can run into the preliminary press. The design of the fixed side walls and of the movable transversal walls can be for instance such as in the embodiment described in the Hostettler, U.S. application Serial No. 38,053, filed June 22, 1960, now Patent Number 3,070,838, granted January 1, 1963; the Hostettler of this patent being the same as the present joint inventor, and both inventions being assigned and recorded to the same assignee, i.e., Fred Fahrni.

What we claim is:

1. A method for forming and transporting a mat consisting of particles intended to be compressed into boards, characterized by forming a mat including the step of moving individual flexible support sheets below a scattering station from which particles are scattered onto the flexible support sheets, moving the mat-loaded flexible support sheets forward along a rectilinear path towards the input end of a press loading device, separating the support sheets from the mat by reversing the moving direction of the support sheets and peeling the support sheets from the mat which mat continues to move along a straight path to be taken over by conveying means, and moving the empty support sheets back to the scattering station along a path lying directly beneath the path along which the mat-loaded support sheets were guided.

2. A device for forming and transporting mats consisting of particles intended to be compressed into boards, characterized by a scattering station, individual pliable supports adapted to carry a mat consisting of scattered particles, a multistage press loading device comprising a plurality of horizontally arranged carriers, conveyor means extending from the scattering station to the area in the vicinity of the input end of the press loading device and being adapted to convey the mat-loaded supports from the scattering station towards the input end of the press loading device and to convey the empty supports back to the scattering station, and means arranged in the area in the vicinity of the input end of the press loading device for reversing the direction of the conveyor means and the pliable supports in order to peel the supports off the mats.

3. A device according to claim 2, characterized in that said conveyor means comprises two chain transport systems, one continuously-driven first chain transport system arranged below the scattering device, and one discontinuously-driven second chain transport system arranged between the first chain transport system and the press loading device, and extending beyond a preliminary press.

4. A device according to claim 2, characterized in that the reversing means comprises a horizontally arranged roller in front of the input end of the press loading device.

5. A method for forming and transporting mats consisting of particles intended to be compressed into boards, characterized by forming mats including the step of moving individual pliable supports below a scattering station from which particles are scattered onto the supports, moving the mat-loaded pliable supports forward along a rectilinear path into a preliminary press, interrupting the movement of the supports during the time of preconsolidation of the mats in the preliminary press, moving the supports with the preconsolidated mats towards the input end of a press loading device, separating the supports from the mats by reversing the moving direction of the supports and peeling them from the mats which continue to move along a straight path and are taken over by a carrier, and moving the empty supports back to the scattering station along a path lying directly beneath the path along which the mat-loaded supports have been guided.

References Cited by the Examiner

UNITED STATES PATENTS

2,574,915	11/51	Fuller.	
2,696,330	12/54	Fahrni	18—47.5
2,845,662	8/58	Clark.	
2,878,728	3/59	Clark.	
2,923,030	2/60	Himmelheber et al.	18—47.5
2,960,722	11/60	Freeman	18—4

FOREIGN PATENTS

466,822	7/50	Canada.

ALEXANDER H. BRODMERKEL, *Primary Examiner.*

MICHAEL V. BRINDISI, *Examiner.*