

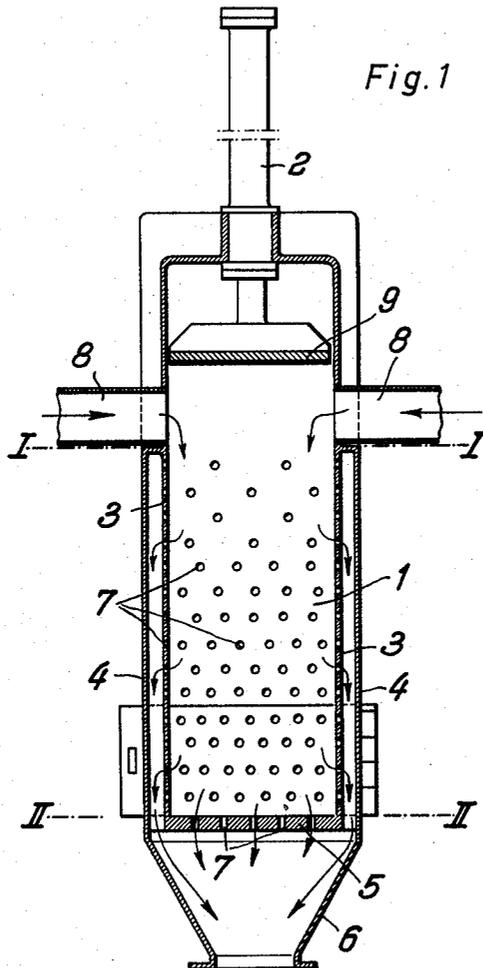
Oct. 4, 1960

P. MOSER
BALING PRESSES

2,954,730

Filed July 3, 1956

2 Sheets-Sheet 1



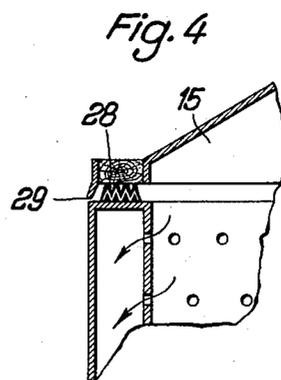
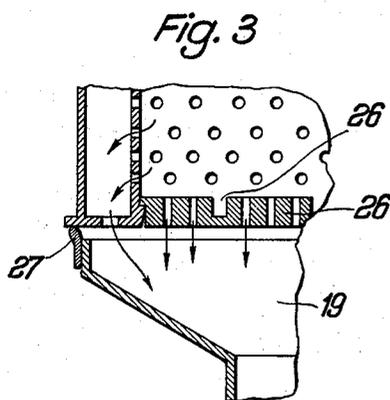
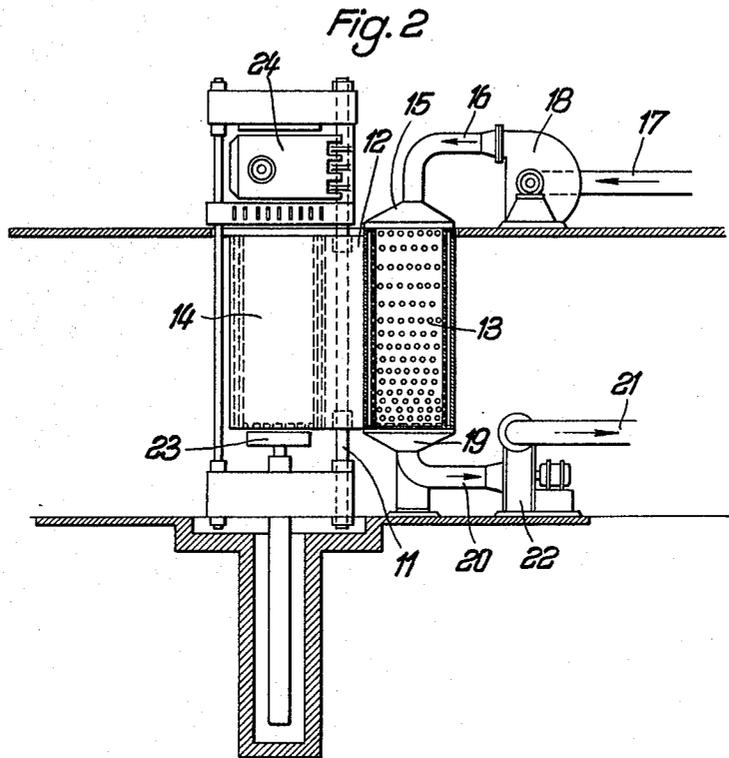
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BALING PRESSES

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For the operation of baling presses for loose fibrous material, such as cotton wool, wool, staple fibre, artificial fibres and so forth, the conveyance of the material to the press and the charging of it into the press-box are of great importance. Whereas, previously, the material to be pressed was conveyed to the press by hand with the use of conveyor hands, in recent times conveyor devices operated by compressed air or by suction have been used to convey the fibrous material to the press. On the press itself in all cases the material was charged to the press-box either by hand or by a feeding device and was usually pre-compressed by means of a plunger or stamp and finally compressed into bales.

The invention relates to a baling press having a conveyor device for the loose material which is operated by compressed air or by suction and precedes the press-box. It eliminates the apparatus previously provided between the conveyor device and the press itself and yet enables the press-box to be properly filled and the filled material to be pre-compressed. According to the invention, the air current of the conveyor device is conducted through the press-box itself and the press-box is in the form of a container in which the material to be pressed is deposited. Preferably, the walls of the press-box are provided with slots or holes for the passage of the air which conveys the fibrous material into the press-box. The press-box can then be made with double walls and the space between the walls can be used as an air passage.

The air which conveys the loose fibrous material passes through the holes and slots in the walls of the press-box and also flows through the deposited fibrous material, so that the fibrous material deposited in the press-box becomes very compact. In the baling press according to the invention, the pre-compression of the fibrous material by the air used for conveyance is almost as good as was hitherto obtained by means of the stamp or plunger. When the press-box is fully charged the press plunger can be operated immediately to compress the fibrous material into a bale.

The deposition of the fibrous material in a compact form in the press-box can be further promoted by also making the wall of the press-box opposite the press plunger in the form of a double wall having slots or holes. It is also preferable to design or arrange the openings for the passage of the air in such a way that the cross-section available for the passage of the air through the slots or holes increases in the direction towards said wall opposite the plunger. The air used for conveyance which contains dust can be conducted away in a particularly advantageous fashion, if the hollow spaces between the side walls of the press-box are in communication with the hollow space in its end wall and the outer portion of this end wall has a funnel-shaped outlet for the air.

In order to avoid having to discontinue the supply of the fibrous material to the press during the compression of the material into a bale, it is desirable to provide the press in known manner with a number of press-boxes

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which can turn about a vertical axis and can thus be brought one after another into a position to co-operate with a hydraulic plunger. In this case the baling press is so constructed that the connection for the conveyor device and the bottom wall containing the outlet for the air are fixed in position and, when a press-box is being charged, coact with the ends of the rotatable press-box which has only side walls.

In order that the invention may be easily understood and readily carried into effect, two embodiments of a baling press constructed in accordance with the invention are illustrated by way of example in the accompanying drawings, in which

Fig. 1 is a section through a baling press in which the press chamber and the hydraulic pressure device form a structural unit;

Fig. 2 illustrates partly in section a baling press having two press-boxes fixed on a rotatable carrier, and

Figs. 3 and 4 show on a larger scale details of the press shown in Fig. 2.

Referring to Fig. 1 of the drawing, the press consists of a press-box 1 and a press cylinder 2 which forms a structural unit with it. The press-box has double walls. The inner side walls 3 of the press-box are spaced a small distance from the outer side walls 4. The inner bottom wall of the press-box is indicated by the numeral 5 and is surrounded by an outer wall 6 forming a funnel-shaped air outlet. The inner walls 3 and 5 are provided with holes 7 and, in the example illustrated, more holes are provided in the lower part of the press-box 1 than in the upper part.

Two pipes 8 are connected to the upper part of the press-box 1. They open into the interior of the press-box and are connected to an air supply installation which conveys the fibrous material to the press. Preferably, the air supply installation is operated by means of a suction blower connected to the air outlet funnel 6. The plunger 9 of the hydraulic cylinder 2 is situated above the pipes 8.

The method of operation of the described baling press is as follows. When the press-box 1 is to be charged with fibrous material, the plunger 9 of the cylinder 2 is in the upper position illustrated in the drawing. By means of the air supply installation which forms no part of the invention and the details of which are not illustrated since it may be of a known kind, a current of air which conveys the fibrous material into the press-box 1 is caused to flow through the pipes 8 into the press-box. The fibrous material is deposited in the press-box 1 and the air used for conveyance is sucked through the openings 7 in the inner walls 3 and 5 into the space between the walls 3 and 4 and also into the funnel-shaped outlet 6, and passes through conduits, which are not illustrated, to the suction blower.

Owing to the fact that a larger number of holes 7 is provided in the lower part of the press-box than in the upper part, the conveyed fibrous material is first mainly deposited in the lower part of the box. The deposited fibrous material is precompressed by the air which presses on it and part of which can only reach the outlet openings 7 after passing through the fibrous material, so that finally when the box 1 has been filled up to the level of the pipes 8 there is a dense compacted mass of fibrous material in the press-box which is sufficient to form a bale when firmly compressed by the hydraulic press 2, 9.

When the press-box is full the supply installation is stopped, that is to say the further conveyance of fibrous material is discontinued and a pressure liquid is admitted to the cylinder 2 and the plunger 9 is moved downwards by means of the hydraulic piston. The pre-compressed fibrous material in the press-box 1 is thereby strongly

compressed and a solid bale is formed. The lower part of the press-box is provided as usual with doors which can be opened laterally, so that the finished bale can be corded and removed to one side after withdrawal of the plunger 9. After this the doors are again closed, and when the plunger is again in its upper position, the supply installation is re-connected and the press-box 1 is re-charged with fibrous material.

The doors provided in the lower part of the press-box 1 must, of course, also be double walled and care should also be taken that, when the doors are shut, their upper and lower edges fit closely against the edges of the walls 3, 4 and 5, 6 which are above and below them.

In order to improve the precompression of the fibrous material in the press-box 1, it is advantageous to provide a pressure blower in addition to the suction blower. Also, the deposited fibrous material becomes well compacted if the suction is continuously operative and the pressure of the air which conveys the fibrous material is shut off for a short time. Then, when the compressed air is again connected, the deposited fibrous material is moved downwardly like a piston by the inflowing compressed air.

If the baling press is provided with a number of press-boxes which can be brought into position one after another to coact with the hydraulic plunger by turning them about a vertical axis, the upper conveying part may be in the form of a bell with a central inlet. In this case the rotatable press-boxes are so constructed that, at the levels of the dotted lines I—I and II—II in the drawing, they join respectively the connection for the conveying means, which connection is fixed in position and the bottom part 5, 6 which is also fixed, tight joints being formed when the press-box is in the charging position.

A baling press of this kind is illustrated in Figs. 2-4. As shown in these figures, two double-walled press-boxes relatively off-set by an angle of 180° are mounted on a carrier 12 which can rotate about an axis 11. The press-box 13 is disposed below a bell 15 to which the fibrous material to be compressed is conveyed through pipes 16, 17 by means of a motor driven blower 18 and the lower part of the press-box 13 is disposed above a suction bell 19 through which the air is withdrawn through pipes 20, 21 by means of a second motor driven blower 22. The press-box 14, on the other hand, is disposed above a hydraulically actuated press plunger 23 and below a baling press-box 24 provided with doors. As shown in Fig. 3 the bottom of each press-box consists of a plate 25 which is provided with air outlet openings and has grooves 26 for the reception of cords for the bale. At its upper edge the bell 19 is provided with a sealing member 27 of rubber or the like which, when either box 13 or 14 is in the filling position, bears tightly against its under surface. The upper ends of the press-boxes 13 and 14 are sealed against the bell 14 in the manner shown in Fig. 4 by means of brushes 28 and a rubber sealing member 29 which bears against the upper surface of the box.

The method of operation of the baling press shown in Figs. 2-4 is as follows.

When the carrier 12 is in the position illustrated in Fig. 2, the press-box 13 is situated between the bells 15 and 19. The fibrous material to be compressed is conveyed into the box 13 by means of a current of air produced by the blowers 18 and 22 and the material is pre-compressed in the box 13 in the manner previously described in connection with Fig. 1. When the press-box 13 is sufficiently filled, the carrier 12 is rotated about the axis 11, until the press-box 13 is above the plunger 23 and below the baling press-box 24. At the same time the press-box 14 is moved into the filling position between the bells 15 and 19. The two blowers 18 and 22 must, of course, be disconnected during the rotation of the carrier 12.

After the press-boxes 13, 14 have been changed over, the hydraulic drive of the press plunger 23 is connected and the blowers 18 and 22 are also again operated. Consequently, while the contents of the previously filled press-box 13 are being pressed upwards by the press plunger 23 into the baling press-box 24 and compressed into the finished bale, the press-box 14 is being filled at the same time by means of the current of air supplied by the blowers 18, 22. After the compression of the bale has been completed, the doors of the press-box 24 are opened and the bale is corded in a known manner and then ejected from the press. After this, the doors of the baling press-box 24 are again closed.

When the second press-box has been sufficiently filled, the carrier 12 is again rotated about the axis 11 and the filled press-box is brought into position over the plunger 23. The described procedure is then repeated on compressing each bale.

The baling press shown in Figs. 2-4 enables working to be carried out almost continuously, the only interruption being for a short time while the blowers are disconnected. Thus, when the contents of a press-box which has been previously filled is being compressed into bales the second press-box is already being filled.

In the constructional example illustrated, the supply of the fibrous material takes place from above and the outlet for the air used for conveyance is below. The invention can, however, be carried out in such a manner that the supply of the fibrous material takes place from below and the outlet of the air used for conveyance is at the top. The baling press of the invention can also be horizontally arranged.

I claim:

1. A baling press for loose fibrous material comprising, a press box having a side wall and an end wall; a power-operated plunger operable in said press box and disposed to face said end wall, said end wall being adapted to withstand the pressure generated by said plunger when compressing said material into a bale; a door forming part of said side wall when closed and permitting removal of a bale from said press box when open; means adapted to convey said material into and to deposit it in, said press box, said means including at least one inlet for a current of air mixed with said material for entrance into said press box, there being a plurality of apertures in said side wall of said press box to serve as outlets for said air from said press box, the cross-sectional passage area of said apertures per unit of area of said side wall increasing with the distance of said apertures from said inlet, collecting means encircling said press box adapted to collect the individual currents of air issuing from said press box through said apertures; and connecting means adapted to connect at least one suction type blower to said collecting means, said connecting means and said collecting means being arranged so as to ensure symmetrical air current conditions in said press box.

2. A baling press as claimed in claim 1, in which the cross-sectional passage area of each of said apertures is substantially the same for all of said apertures, and in which the relative frequency of said apertures increases with their distance from said inlet.

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