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APPARATUS FOR THE PRESSING OF FIBRE GOODS INTO BALES

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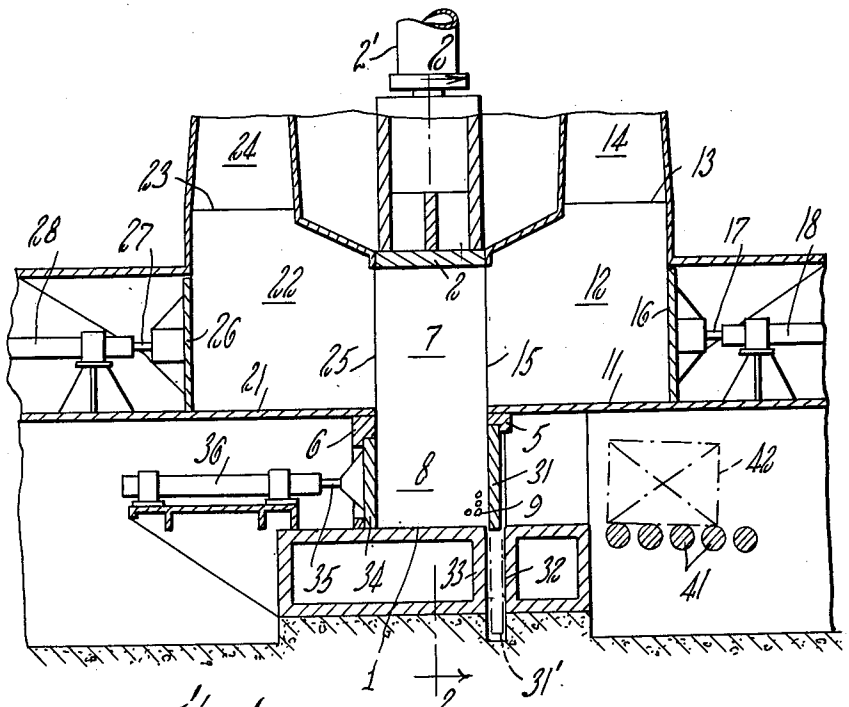


Fig. 1.

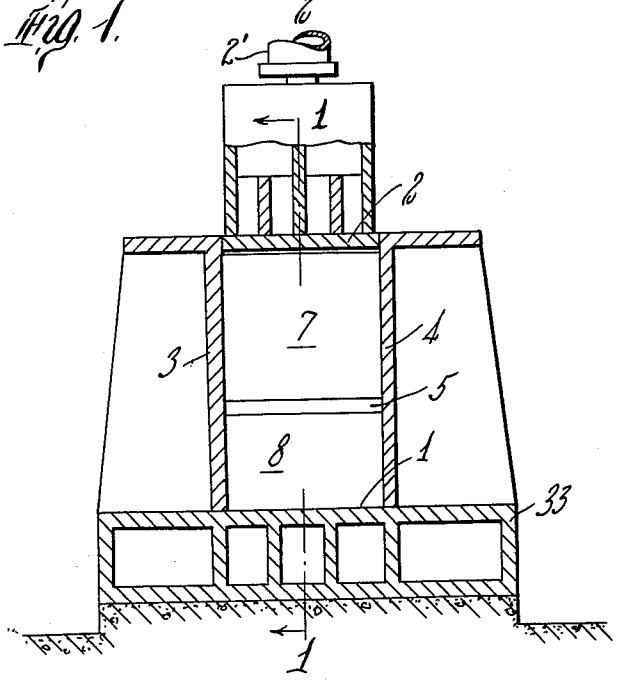


Fig. 2.

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APPARATUS FOR THE PRESSING OF FIBRE GOODS INTO BALES

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1 Claim. (Cl. 100—215)

The present invention relates to an apparatus for the pressing of fibre goods into bales.

In the pressing of fibre goods into bales it has hitherto been the general practice to start from fibre goods in the form of a web, such as is obtained in the making of cellulose or woodpulp. In the pressing of bales from fibre goods in the form of a continuous web the web is cut up into sheets of suitable size, which are laid on one another successively so as to form a pile, which is then pressed between a base and a stamp. This method involves a number of drawbacks, partly by the excessive drying of the outside layer of the web (so-called "skin-drying"), partly by the fact that the fibre goods which are produced merely by the pressing of the web must contain considerable moisture. If the web of the sheets, for example of woodpulp or so-called semi-chemical pulp, are completely dried before the pressing, it will be difficult later to get the fibre goods sufficiently defibered.

On the other hand it is of course, with regard to freight costs, desirable to keep the content of moisture as low as possible.

The present invention relates to an apparatus for pressing of fibre goods into bales in which it is possible to work with a very low content of moisture. In the process according to the invention the fibre goods are defibered and preferably dried before the pressing, after which successive portions of the fibre goods are pressed in layers on the top of one another under gradual building up of a bale.

It is per se not a new feature in the pressing of fibre goods into bales to start from defibered fibre goods. Thus it is known to press cotton into bales by passing the cotton fibre in loose state into a press and pressing it into a bale. However, in this known way it has been the practice to use a press in which the stamp operates with very large stroke relatively to the desired thickness or height of the bale. The whole quantity of cotton fibre which is needed for the formation of a bale is conveyed into the pressing chamber and pressed together to the desired thickness.

In contrast with this, in the method according to the invention one proceeds, as stated above, in the way that the fibre goods are pressed in layers under gradual building up of a bale. The advantages of this method is that it is possible to work with very loose, defibered fibre goods, without being necessary therefore to make the pressing chamber or the stroke of the stamp correspondingly large.

The invention comprises, as stated, an apparatus for carrying out the process. In the apparatus according to the invention there is used, in a way similar to the one generally employed, a horizontal base and a stamp vertically movable above this. The characteristic feature of the apparatus according to the invention is essentially that the pressing base forms the bottom of a pressing chamber, open above, of shape and size corresponding to the desired bale, that the stamp in its uppermost position stands at a distance above the top edge of the pressing chamber, and that the apparatus is provided with appliances for supply of a portion of the fibre goods to the chamber underneath the stamp each time this stands in its uppermost position. Preferably there is provided above and a little to the side of the pressing chamber a chamber, the plane bottom of which is flush with the upper edge of the pressing chamber and which is fitted with a supply opening for fibre goods, which chamber is open on the side turned toward the space above the pressing chamber, whilst the opposite wall is formed of a feeding piston devised to push the fibre goods in the chamber in the direction of the open side and underneath the stamp when this stands in elevated position. The feeding piston is preferably devised to remain during the descending movement of the stamp in pushed-out position in such manner that it forms a vertical wall adjacent one side of the stamp during the descending stroke of this.

According to a preferred embodiment of the invention the apparatus is provided with two chambers, each with its supply opening for the fibre goods and each with its feeding piston devised symmetrically on each side of a vertical plane through the axis of the stamp.

The stamp is conveniently made on one side without a fixed wall, so that an opening is formed, through which the finished bale can be passed out. During the pressing this opening can conveniently be closed by means of a closing plate.

Further features of the invention will appear from the following description in connection with the drawing, which diagrammatically shows a preferred embodiment of an apparatus according to the invention.

In the drawing:

FIG. 1 is a vertical section along the line 1—1 of FIG. 2. The figure shows the lower part of an apparatus according to the invention, the upper parts comprising the driving means for the stamp being omitted. These parts can be of known construction and do not require any detailed description.

FIG. 2 is a section along the line 2—2 in FIG. 1.

In the drawing **1** denotes a horizontal pressing base, for example in the form of a plate fastened to a bed. **2** is a stamp fastened to the lower end of a stamp rod forming part of a fluid actuated cylinder **2'**, and which by means of a control means not shown in the drawing can be moved up and down, so that the stamp in the position shown in the drawing lies in its extreme upper position, and in its lower extreme position will rest against the base **1** or against the fibre goods lying on this.

To the base there are attached two opposite vertical walls **3** and **4**. These extend as far as the upper position of the stamp **2**, as shown in the drawing. The walls **3** and **4** are at some height above the base **1** joined together by horizontal stays, **5** and **6** respectively. **11** and **21** are horizontally arranged plates, which are supported by the stays **5** and **6**. The plate **11** forms the bottom of a chamber **12**, which above at **13** stands in open connection with a supply channel **14** for the goods to be pressed, and which at its left end, at **15**, communicates with the space **7** underneath the stamp **2**. **16** is a plate-shaped feeding piston, which is fastened to the left end of a piston rod **17**, which at its other end carries a piston, not shown in the drawing, which operates in the cylinder **18**.

In a similar way the plate **21** forms the bottom of a chamber **22**, which above at **23** communicates with a supply channel **24** for the goods to be pressed. At its right end, at **25**, the chamber **22** communicates with the space **7** underneath the stamp **2**. The parts **26**, **27** and **28** are identical with the parts **16**, **17** and **18**, and do not require any further description.

8 is a pressing chamber, the bottom of which is formed by the base **1**. Two opposite walls in the pressing chamber are formed by the walls **3** and **4**. In these walls there can suitably be provided holes, of which only a few are diagrammatically indicated at **9**. Through these holes air can escape from the pressing chamber during the working stroke of the stamp. A third wall is formed by a plate **31**, devised to be capable of being lowered after the completed pressing of a bale, into a depression **32** in

the bed **33**, to the position **31'** shown in the drawing by broken lines. The fourth wall of the pressing chamber is formed of a plate-shaped expulsion piston **34**, fastened to the right end of a piston rod **35**, which at its other end is provided with a piston, not shown in the drawing, which operates in the cylinder **36**.

The mode of action of the press is as follows:

The drawing shows the device in position for starting the pressing of a bale. The stamp **2** is raised to its uppermost position, the pistons **16** and **26** are drawn back, the plate **31** is raised and the expulsion piston **34** is drawn back.

Through the supply channels **14** and **24**, goods to be pressed are fed into the chambers **12** and **22**. Whilst the stamp **2** stands in the position shown in the drawing, the pistons **16** and **26** are caused to move toward each other, in the course of which the goods lying in chambers **12** and **22** are pushed into the space **7** underneath the stamp **2**, where the goods fall entirely or partly down into the pressing chamber **8**. Whilst the pistons **16** and **26** remain in pushed-out position, so that they form with the walls **3** and **4** a prolongation of the walls of the pressing chamber **8**, the stamp **2** performs a working stroke. In the course of this the goods are compressed in a relatively thin sheet of material, either against the base **1** or against already pressed goods which lie on the base. The stamp **2** now returns to its upper position, while at the same time the pistons **16** and **26** again advance toward each other and push the goods, which in the meantime have been supplied through the channels **14** and **24** to the chambers **12** and **22**, underneath the stamp **2** and entirely or partly down into the pressing chamber **8**. Then the same operation is repeated, in such manner that there is built up layer by layer a bale of pressed goods in the pressing chamber. When the bale has reached the desired height, the operation of stamp **2** and pistons **16** and **26** is stopped, the plate **31** is lowered to the position shown by the broken lines **31'**, the piston **34** is pushed to the right, and the bale is pressed out on to a roll conveyor **41**. A bale **42** is here indicated by broken lines.

I claim:

Apparatus for the pressing of successive volumetrically defined increments of defibered fiber goods into a bale into which said increments are successively pressed to have the consistency of individual layers compacted into a bale from which the individual layers are adapted to be peeled off successively, which comprises a base, a pressing chamber having bottom, side and end walls fixed during said pressing operation to conform to the dimensions of a bale to be pressed therein, a vertically movable stamp disposed over said pressing chamber for movement from above to within the pressing chamber, a receiving chamber for defibered fibre goods disposed above, projecting to each side of and opening into said pressing chamber, a pair of oppositely disposed feeding pistons each having a pusher face arranged for movement transversely across said receiving chamber toward the other said pusher face to a position in which said faces form upward extensions of the walls of said pressing chamber and define opposite sides of a semi-compression chamber within said receiving chamber above said pressing chamber, said pusher faces acting to partially press and to push a volumetrically measured increment of material into said semi-compression chamber, means for moving said vertically movable stamp downwardly with each advance of said pusher faces thereby to compact and to press each successive layer of material onto a bale within said pressing chamber, and means comprising a removable plate forming a door in one wall of said pressing chamber and a presser plate forming the opposed wall of said pressing chamber movable to eject the completed bale from said pressing chamber through said door.

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