July 19, 1949. A. ALUOTTO 2,476,574

BALING PRESS

Filed Jan. 8, 1945

FIG. 1.

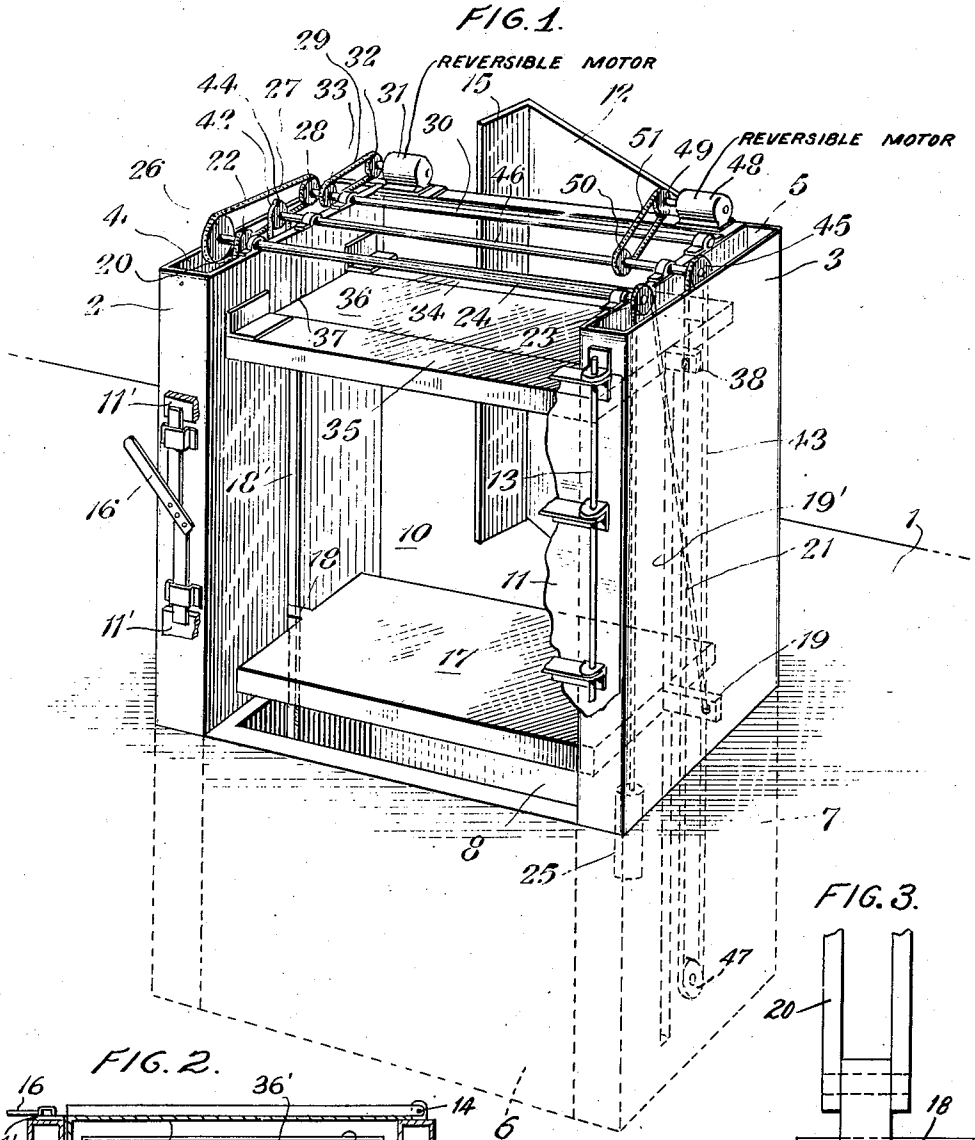

FIG. 2.

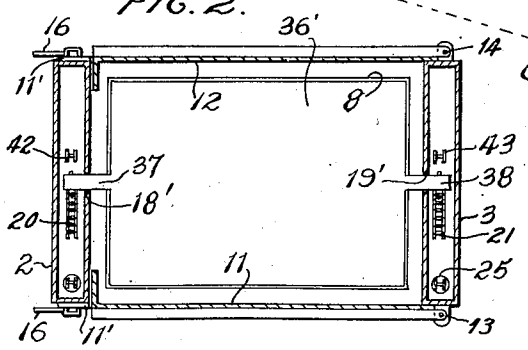

FIG. 3.

INVENTOR
Antonio Aluotto
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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BALING PRESS

Antonio Aluotto, Brooklyn, N. Y.

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2 Claims. (Cl. 100—12)

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This invention relates to baling presses, and more particularly to presses adapted to bale such loose and bulky material as waste paper, cardboard cartons, rags, and like materials. The invention is especially concerned with baling presses having a chamber for receiving the loose material and a platen or ram which compresses the material against a compression head of the chamber. In baling presses of this type, it is difficult to form a compact bale of any great size or weight because it is usually necessary to load the chamber to its full capacity with loose material and then form the bale in a single compression stroke. This results in either a large relatively loose and light bale, or a dense bale which is quite small. This invention aims to overcome the disadvantages in the apparatus heretofore proposed for baling such loose material as paper and the like.

The invention provides an improved baling press comprising means for initially compressing the material in the chamber in a succession of compression strokes as the material is added to the chamber, resulting in a fairly compact mass of material which is adequate for forming a large bale, and means for subjecting the compact mass to the final compression. Advantageously, the compression head is provided with a platen or ram which is reciprocated downwardly and upwardly from time to time during the loading of the chamber to compress or pound the loose material into a relatively compact mass during the loading operation. A second platen is used as a bottom for the chamber and the material is pressed thereagainst during the initial compression. When this initial compression is completed, the platen of the compression head is moved into its position in the compression head and the material is compressed thereagainst by the second platen to its ultimate size.

In one of its embodiments, the invention provides a baling press having a chamber with a pit in the lower portion in which the second or lower platen forms the bottom against which the material is initially compressed in a succession of compression or pounding strokes of the platen of the compression head (upper platen) and the initially compressed material is finally compressed by the lower platen in forming the completed bale. In a preferred and more complete embodiment of the invention, the chamber has an upper portion which extends above a floor or loading platform and doors are provided therefor on opposite sides for loading and unloading the chamber, and the chamber extends an appreciable distance below the platform forming the pit in which the loose material is thrown for the initial compression. The lower platen forms the bottom of the pit and the lower and upper platens are preferably pulled during their compression strokes by means of chains engaging sprockets on power-driven shafts.

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These and other novel features of the invention will be better understood after considering the following discussion taken in conjunction with the accompanying drawing, in which Fig. 1 is an isometric projection of an embodiment of the invention, Fig. 2 is a more or less diagrammatic horizontal sectional view on a reduced scale of a modified form of the baling press, taken on a plane immediately above the upper platen and looking downwardly, and Fig. 3 is a view of a detail.

The baling press illustrated in the drawings is rectangular in horizontal cross-section, stands in an upright position, and is constructed or arranged in such a manner that a part extends below the floor or loading platform 1 with the principal part extending above the floor. The end walls 2 and 3 are preferably formed of structural steel supports and plates because they carry the load, that is, they absorb the forces necessary in compressing the material, and are preferably so arranged that they each have interior channels or spaces 4 and 5 for locating parts of the operating equipment. The lower portions of the side walls 6 and 7 are secured to the end walls and form a pit 8 below the level of the floor. The pit is actually a part of the chamber 10 which occupies the interior space of the baler. While the baler may be supported on the floor 1 with the lower portions of the walls therebelow in a depending position, the lower portion of these walls may be mounted on any suitable foundation.

The doors 11 and 12 are pivoted on the end wall 3 by the hinges 13 and 14 and each door preferably has an interiorly projecting flange or lip 15 which fits inside of the ends of the platens assuming a position parallel to the end wall 2 when the door is closed. Any suitable locking means, such as the lever-operated sliding bolt 16, may be used to lock the doors. The bolt ends slide over projecting lugs 11' on the doors and lock them in their closed position.

The lower platen or ram 17 is of rectangular configuration and has projecting arms 18 and 19 slidable in the channels 18' and 19' and attached to chains 20 and 21 which engage the chain sprockets 22 and 23, respectively, on the shaft 24. The projecting arms 18 and 19 may be con-

nected to the ends of the chains 20 and 21 in any suitable manner, such as by bolting, as shown in Fig. 3. The lower end of each of these chains carries a counterweight 25 which holds the free end of the chain taut. The shaft 24 has on one end the sprocket 26 which is driven by the chain 27 on the sprocket 28. The sprocket 28 is on the shaft 30 which is driven by the motor 31 through sprockets 32 and 33 and chain 29. Using a motor of around 7 H. P., for example, and with a suitable proportioning of the various sprockets, the platen 17 may be caused to apply a great pressure to the material in the chamber 10. When the motor is stopped or reversed, the weight of the platen 17 causes it to travel to the bottom of the pit 8.

In the upper portion of the chamber, and securely attached to the end walls 2 and 3, is the compression head formed of two end bars 34 and 35 preferably formed of structural steel and welded, bolted, or otherwise secured to the upright supporting structures which carry the load on the end walls. The central part of the compression head is formed of the platen 36 which has end projections or arms 37 and 38 slidably guided in the upright channels 18' and 19' in the end walls. The entire compression head may be formed of the upper platen, as shown at 36' in Fig. 2, or partly by the bars 34 and 35 as shown in Fig. 1. The bars 34 and 35 may be of any desired width; for example, they may occupy only a small part of the compression head. The arms 37 and 38 are attached to endless chains 42 and 43 which are mounted on the sprockets 44 and 45, respectively, on the drive shaft 46. The connection between the arms 37 and 38 and the chains 42 and 43 may be similar to that between the chains 20 and 21 and the projections 18 and 19. Each of these chains passes around a pulley 47 near the bottom of the end walls and they are thereby held in suitable taut positions and prevented from becoming entangled with other parts of the equipment. The motor 48 drives the shaft 46 through the sprocket wheels 49 and 50 and the chain 51; the sprocket wheel 49 being driven from the motor shaft through any suitable friction clutch, as in the manner shown in the Cresci Patent No. 1,371,074. When the motor 48 is driven in one direction, the chains 42 and 43 pull the platen 36 downward and when driven in the opposite direction they pull the platen upward. It is, accordingly, possible to drive the platen 36 in a succession of upward and downward pounding strokes merely by reversing the motor 48, in a manner similar to that disclosed in the aforesaid patent to Cresci. It is understood, of course, that suitable switching equipment for operating both motors is necessary and that any suitable type of conventional switching equipment may be used for controlling these motors.

In employing apparatus of the invention for forming compact heavy bales from loose paper or cartons, for example, the baler is preferably so mounted with respect to the floor or platform 1 that the loose material may easily be thrown through one of the open doors, for example door 11, while door 12 is closed. Before loading the pit, the platen 17 is moved to the bottom of the pit where it becomes the bottom of the chamber 10. As the material is accumulated in the pit 8, the platen 36 is moved upward and downward in a succession of pounding strokes to compact the loose material against the upper surface of platen 17 in the initial compression. When the pit becomes filled with the material which is fairly well compressed, door 11 is closed and then the platen 36 is moved up to its upper position shown in the drawing, at which time it becomes a part of the compression head. As the platen 36 is substantially smaller and lighter than the platen 17, the friction and inertia of the gearing and driving motor 48 will be sufficient to maintain it in its uppermost position when the motor 31 is stopped. Motor 31 is then started and the platen 17 is pulled upward slowly, bringing the partially formed bale into compressing engagement with the compression head. In this manner, the material is compressed to its final size. The platen 17 may now be lowered to a position even with the floor 1, the doors are thrown open, and the bale is pushed out. It will be apparent from the foregoing description that the preliminary or initial compression of material in the pit results in the formation of a relatively heavy and appreciably densified mass of material in the form of a more or less partially completed bale. There is such a quantity of material in this partially compressed bale that it is possible to form a finished bale of relatively great weight merely by one upward compression stroke of the platen 17.

I claim:

1. A baling press which comprises side walls and end walls, the side walls and the lower portions of the end walls forming a pit adapted to be positioned below the level of a loading floor with the top of the pit substantially level with the floor, the end walls extending above the pit and in part defining a chamber thereabove, a lower platen which in its lowermost position forms the bottom of the pit, a compression head including an upper platen adapted to have a fixed position at the upper part of the chamber and in such position to constitute a closure for the upper portion of the chamber, a door at one side of said chamber movable to a position to close the chamber at said side, power means for moving the upper platen upwardly, and downwardly below the level of the top of the pit in a succession of compression strokes while the lower platen is maintained stationary in its lowermost position in the pit to initially compress loose material in the pit against the lower platen, means for securing the upper platen in its said upper position, where it acts as a compression head member, after the material initially has been compressed in the pit, and independent power means for raising the lower platen to a level above the upper edge of the pit, while the upper platen is secured in its said upper position, to compress the material against the upper platen in the final compression of the bale, the resulting bale being formed in the chamber above the pit, whereby, after opening of said door, the bale may be removed onto the floor.

2. A baling press which comprises side walls and end walls, the side walls and the lower portions of the end walls forming a pit adapted to be positioned below the level of a loading floor with the top of the pit substantially level with the floor, the end walls extending above the pit and in part defining a chamber thereabove, a lower platen which in its lowermost position forms the bottom of the pit, at least one compression head member attached to the upper portions of the end walls, an upper platen movable into horizontal alignment with said compression head member to form therewith a compression head and a closure for the upper portion of the cham-

ber, a door at one side of the chamber movable to a position to close the chamber at said side, means for moving the upper platen upwardly, and downwardly below the level of the top of the pit in a succession of compression strokes while maintaining the lower platen stationary in its lowermost position in the pit to compress material in the pit against the lower platen, means for securing the upper platen in horizontal alignment with said compression head member to form a compression head after the material initially has been compressed in the pit, and means for raising the lower platen to a level above the upper edge of the pit, while the upper platen is secured in such position, to compress the material against the compression head in

the final compression of the bale, the resulting bale being formed in the chamber above the pit, whereby, after opening of said door, the bale may be removed onto the floor.

ANTONIO ALUOTTO.

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