

- [54] **COMPRESSING AND PACKAGING MACHINE FOR SOFT AND SEMI-SOFT MATERIALS**
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100/250
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- [58] **Field of Search** 53/124 A, 124 B,
53/124 C, 124 D; 100/126, 250

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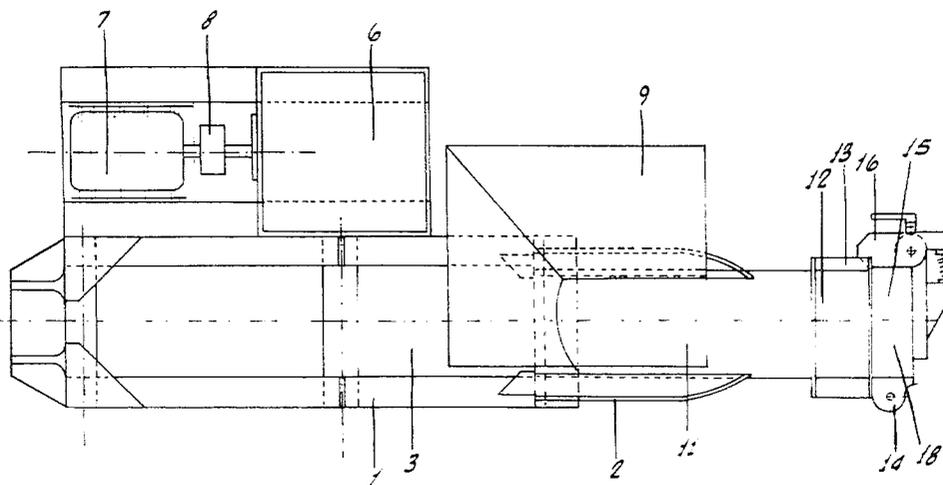
[57] **ABSTRACT**

The present invention refers to a machine devoted to the compression of soft and semi-soft materials such as wool, forage grass, garbage and others, and to the packaging of such materials in the compressed condition.

Products of this type are generally packaged by bailing, with or without an external cover, and secured by lines or hoops, extending around the outside of the bails. The bailed material is, therefore, generally exposed and so it must be protected from damage by weather both during transportation and storage. With regard to garbage, there is no satisfactory process presently known for packaging this material in its raw, untreated condition, and even when the material is treated to inhibit the natural fermentation, it is generally considered that the only practical method of packaging the material is to deposit it loosely in sacks.

The essence of the present invention is the creation of a high pressure pressing machine for packaging such material, including raw domestic garbage. The machine includes a work chamber for eliminating or reducing any water or humidity that the matter may contain, either in its own composition or in its interstices, in proportions which vary between 15 and 40 per cent of its weight. This pressing operation to reduce the water content of the material simultaneously reduces the volume of the material treated by as much as seven of eight parts of the original volume.

4 Claims, 4 Drawing Figures



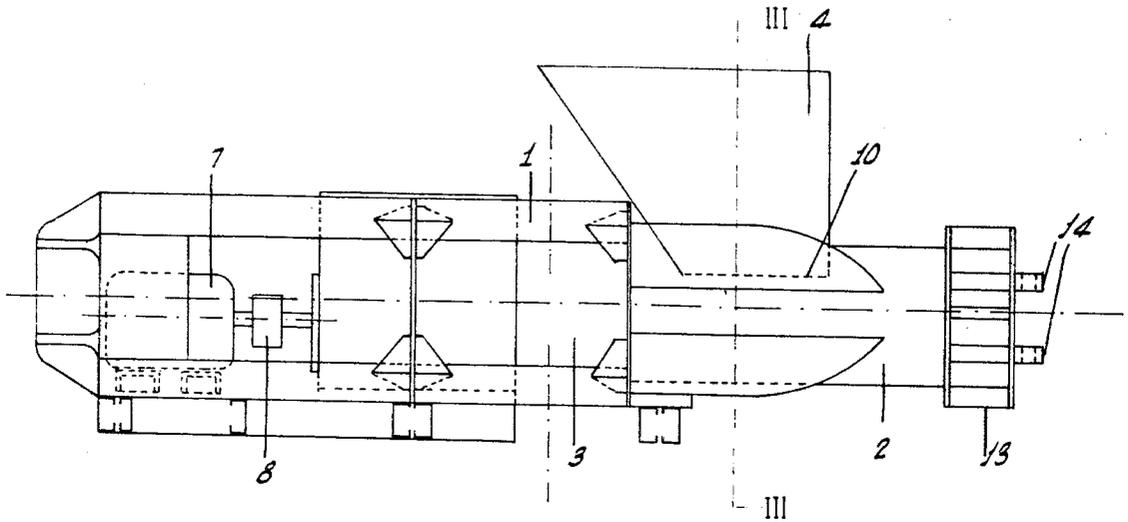


FIG. 1

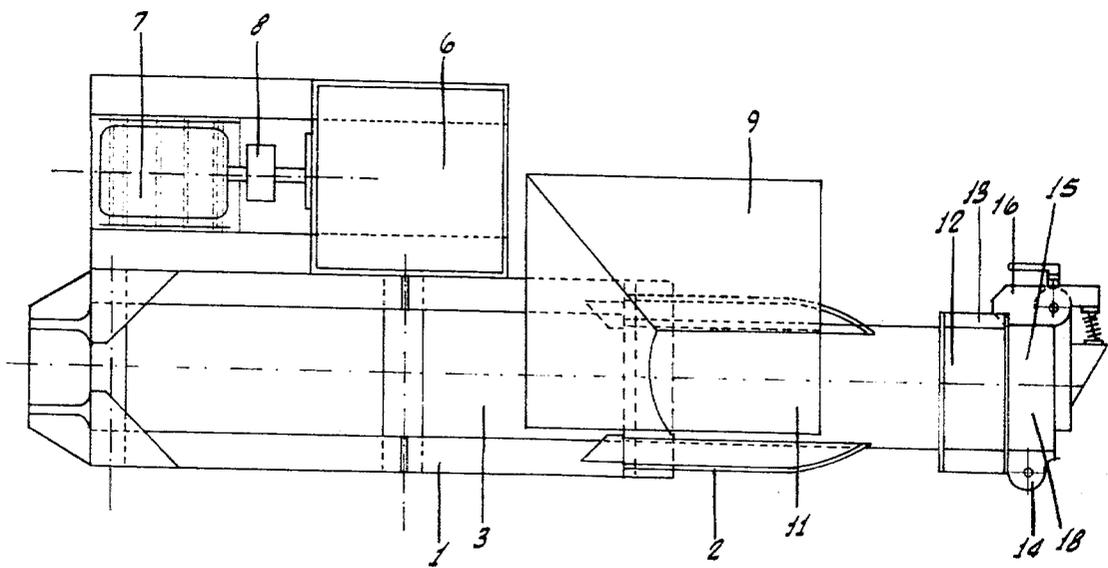


FIG. 2

2 Sheets-Sheet 2

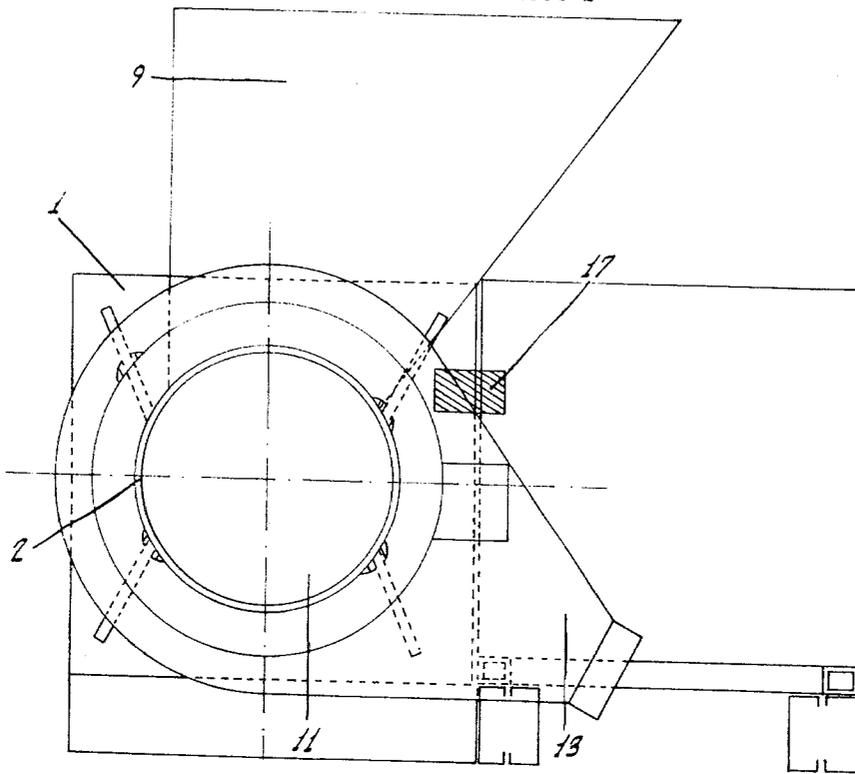


FIG. 3

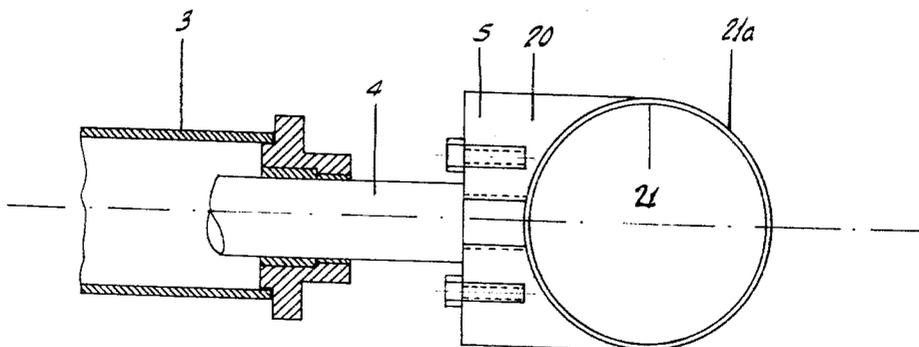


FIG. 4

COMPRESSING AND PACKAGING MACHINE FOR SOFT AND SEMI-SOFT MATERIALS

In a preferred embodiment of the invention, the pressed product is presented in spherical shape and confined between two half covers of the same shape in the machine itself. The half covers are lock seamed or welded together while they are under pressure, forming a tight body which prevents direct contact with outside elements, and due to the reduced amount of air and humidity fermentation of the material is minimized in storage.

The apparatus which is described herein includes a press mechanism including a pump driven by a motor for activating a double effect hydraulic ram which runs along a cylinder located immediately below the outlet of a receiving feeding box in the chamber. Thus, movement of the ram in a longitudinal and horizontal direction within the cylinder pushes the material into a work chamber located at the end of the cylinder and having reinforced walls. This work chamber is provided with a plurality of apparatus around its periphery which permit the outflow of water extracted during the pressing operation. The bottom of the work chamber is in the form of a moveable wall or cover. Suitable safety locks are provided to retain the moveable cover in place during the pressing operation and to permit the opening and subsequent closing in the unloading stage. Unloading of the work chamber may be accomplished by gravitation or with the assistance of a small supplementary run of the ram. In the invention, not only the bottom cover but in addition the head of the hydraulic ram are both concave with complementary half-sphere capacities, and the surfaces are equipped with grooves which maintain the half-covers which will form the spherical container, which half-covers (made of tinned sheet iron, plastic or any other adequate material) have peripherally at the lip a small flange which in the pressured union determines the closing of the assembly.

The bottom cover will have mechanisms to permit the work chamber to be opened by hand while at the same time closing and opening said means by means of pressured fluids from the main hydraulic pump so that while the chamber may be opened or closed manually it normally operates in a totally automatic manner.

As an orienting example, the spherical packages produced in the apparatus may have an approximate diameter of 30 centimeters which for the densities of the matters generally treated represents a weight of 25 to 40 kilos, it being understood that these dimensions and weights have been selected for the purpose of facilitating the handling, transportation, and storage of the packaged product.

The foregoing and further advantages of the invention will be more fully described hereinbelow, with specific reference to the accompanying drawings, in which:

FIG. 1 is a side elevation representation of the pressing machine;

FIG. 2 is a top plan view of the apparatus shown in FIG. 1;

FIG. 3 shows a sectional view taken on line III-III of FIG. 1; and

FIG. 4 shows in detail the head of the work ram.

In accordance with what the drawings represent, the pressing and packaging machine substantially consists of a frame 1 and a head 2 supported on a resisting bed-

plate and equipped for the purpose of rigidity of reinforcement brackets and squares, which may be variable in dimensions and shapes, and therefore are not identified by reference numerals since they may be readily recognized and understood by reference to the drawings.

As regards body 1, its function is the support of hydraulic cylinder 3 on which moves rod 4, which bears the work head 5. Rod 4 is driven in double effect by the pressure of a fluid contained in tank 6 and pressured by a pump, not shown but preferably of a radial type, driven by motor 7, naturally with the interpolation of a flexible union 8. The head 2 supports a feeding box 9 for receiving the matters to be treated. The material passes from feeding box 9 through opening 10 to the receiving end of cylinder 11 and is pushed by the work head or ram 5 toward the work chamber, to the right in FIGS. 1 and 2, where the pressing of the material is initiated. This work chamber has at its final run a punch-hole zone 12 enveloped in a housing 13, to permit the elimination or conduction of the extracted liquids, while at the same time it has supports 14 for receiving the oscillating gate cover 15 secured by the closing lock 16. This closing and opening lock may be moved by hand or else by means of a pressured circuit, depending on the principal which may be located in the position represented in mark 17.

Not only cover 15 but in addition the work ram, in accordance with what has been previously indicated, both present a half-sphere capacity as indicated at 18 of cover 15 in FIG. 2 and in FIG. 4, in which the head 5 receives movably through screws 19 and the conformed supplement 20 so that between the both of them they may receive and keep the symmetrical half-covers 21 and 21a.

The operation, as may be easily understood, is initiated with the receiving at the feeding box of the material to be pressed which passes to the receiving chamber 11, where the ram 5 pushes the matter against the cover 15 of the work chamber in which there has been provided the corresponding container half-cover 21. Initial movement of the ram is carried out at a relatively high speed, with the first movement being at a slow speed to accomplish the desired high pressure pressing to compress the material in the work chamber and eliminate the humidity and water therefrom. In a previous or else a subsequent stage, there is carried out the withdrawal of the work ram for placing the applicable half-cover 21 of the container, in order to finally return to the intensive pressing at the end of which the peripheral flanges enter into contact and they are lock seamed or welded. From this moment on, there is actuated the opening device of the gate cover 15 with which the sphere falls by gravitation or assisted by a small additional run of ram 5 which in its retraction originates either a stroke of pressured air or else the main circuit itself closes the cover of the gate which is thus ready for carrying out a new cycle.

Having sufficiently described the nature and the scope of the invention as well as the manner in which the same may be put into practice, it is made known that in its accomplishment there may be a variation in the materials, the shape and the dimensions, and in general any other detail which is accessory or secondary, provided the same does not alter, change or modify the proposed essence. Accordingly, while I have disclosed and described a preferred embodiment of my

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invention, I wish it understood that I do not intend to be restricted thereto, but that I do intend and include all embodiments thereof which would be obvious to one skilled in the art and which come within the spirit and scope of my invention.

I claim:

1. A machine for compressing and packaging soft and semi-soft materials into substantially spherical packages comprising, a frame, a compression cylinder having an inlet at one end and an outlet at the other end, a work piston mounted within said cylinder for movement therein, said piston having a substantially semi-spherical concave head adapted to receive a first hollow substantially semi-spherical package component for movement therewith within said cylinder, hydraulic ram means for moving said piston between said inlet and said outlet, a feeding box at said inlet for receiving material to be compressed and packaged and for feeding the material into said cylinder through said inlet, liquid outlet means in said cylinder adjacent said outlet to permit the escape of liquid therefrom during movement of said piston and said first package component toward said outlet, and movable gate means mounted adjacent said outlet for movement between a closed position sealing said outlet and an open position remote from said outlet, said gate member having a concave substantially semi-spherical inner wall adapted to receive a second hollow substantially semi-spherical package component in opposed relation to said con-

cave head and in position to engage and mate with said first package component when said gate is in said closed position and when said piston is moved within said cylinder to said outlet, whereby upon movement of said piston to compress material within said cylinder, the material is packaged in a substantially spherical package defined by said first and second package components, and whereby said liquid outlet permits liquid to escape from the material before the package components are brought together to package the compressed material.

2. The machine as defined in claim 1 wherein said liquid outlet means comprises an elimination zone adjacent said outlet and consisting of a band of apertures extending around the wall of said cylinder adjacent said outlet, and a shell extending around said band for containing and directing the extracted liquids.

3. The machine as defined in claim 2 further comprising means for moving said gate between said closed position and said open position, and means for moving said piston within said cylinder to remove a formed package from said outlet when said gate is in said open position.

4. The machine as defined in claim 3 further comprising means on said substantially semi-spherical piston head and said substantially semi-spherical gate wall for engaging and retaining said first and said second package components, respectively.

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