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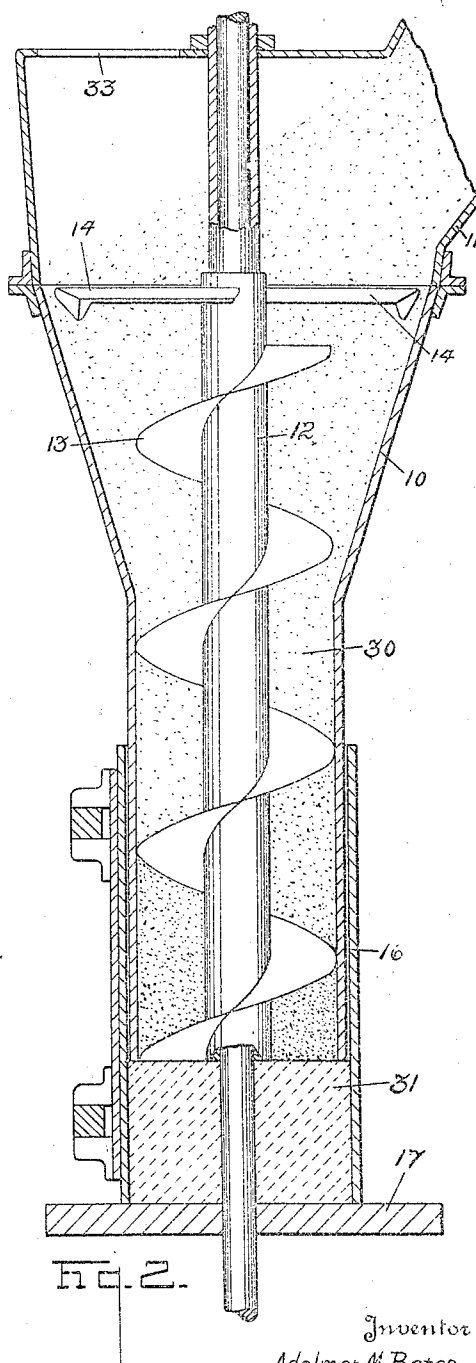
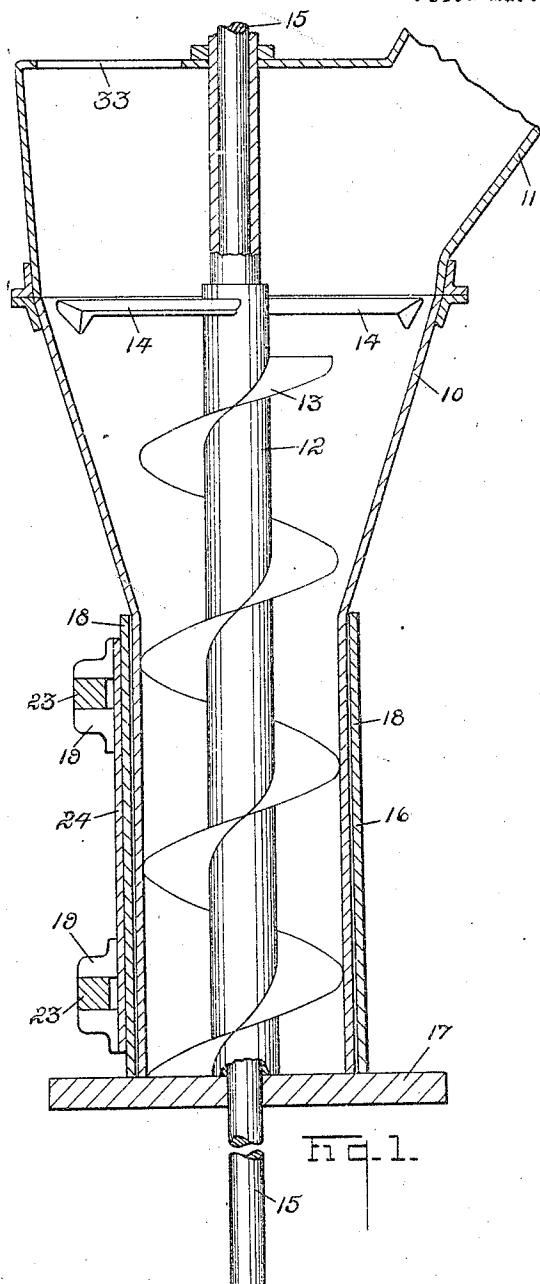
1,521,225

A. M. BATES ET AL

PACKAGING PROCESS

Filed March 17, 1924

2 Sheets-Sheet 1



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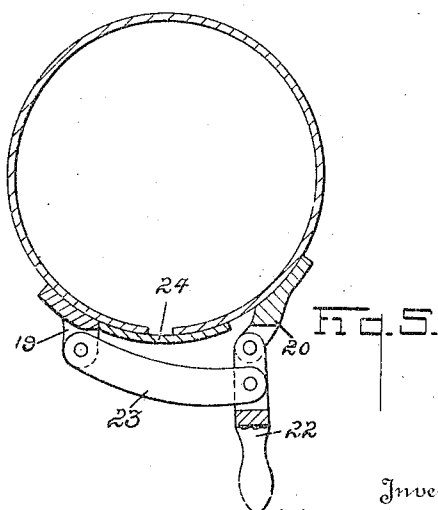
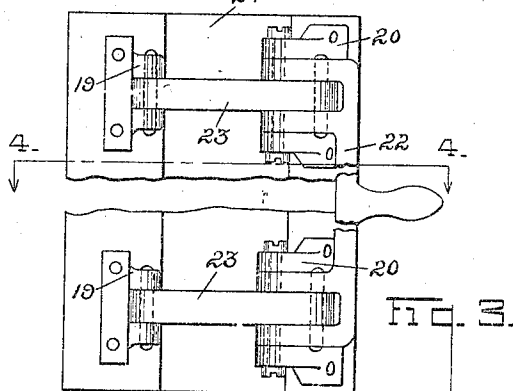
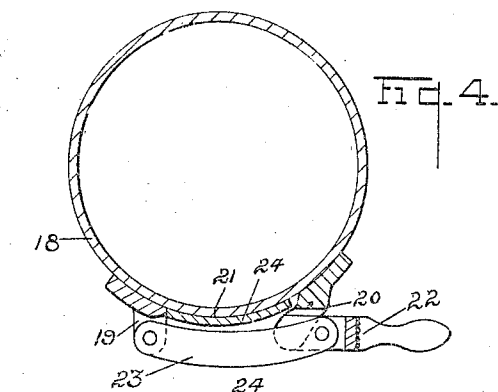
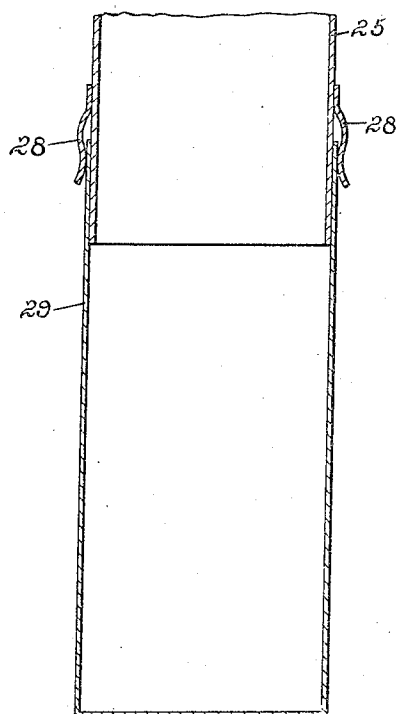
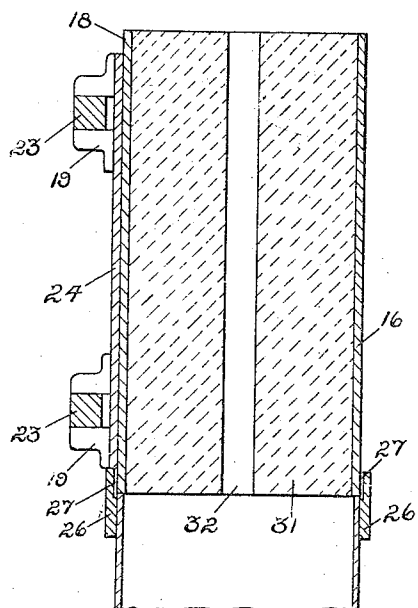
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

ADELMER M. BATES AND JOHANN E. DANCKER, OF CHICAGO, ILLINOIS, ASSIGNORS TO
BATES VALVE BAG COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF WEST
VIRGINIA.

PACKAGING PROCESS.

Application filed March 17, 1924. Serial No. 689,692.

To all whom it may concern:

Be it known that we, ADELMER M. BATES, a citizen of the United States, and JOHANN E. DANCKER, a citizen of Germany, each residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Packaging Process, which invention is fully set forth in the following specification.

Our invention relates to a process of packaging, and more particularly to a process of packaging pulverulent material in bags. The object of our invention is to package the material in such a way that it will occupy the least practicable space and still remain in the desired friable condition. Other objects will appear as the description of the process proceeds.

In the accompanying drawings, Figure 1 is a cross-section of a portion of apparatus which may be used in carrying out our process. Fig. 2 is a similar view with the parts in another position. Fig. 3 is a side elevation of a cartridge suitable for use in our process. Fig. 4 is a cross-section on the line 4-4 of Fig. 3. Fig. 5 is a section similar to Fig. 4, but showing the cartridge expanded. Fig. 6 is a longitudinal section of an apparatus which may be used to carry out the final step of our process. It will be understood that these drawings are diagrammatic.

In Fig. 1 there is shown a casing 10 fed from a hopper 11. Within the casing there is a compacting auger comprising a sleeve 12 which carries a spiral blade 13. Arms 14-14 extend from the sleeve 12 in position to break up and feed down the material as it enters from the spout 11. A rod or shaft 15 extends downwardly through the sleeve 12. Surrounding the lower end of the casing 10 is a cartridge 16 supported on a platform 17. The cartridge 16 consists of a sheet metal jacket 18 carrying lugs 19 and 20 adjacent a line 21 along which the jacket is split. A handle 22 is pivoted on the lugs 20 and is connected by links 23 to the lugs 19, so that the cartridge may be opened or closed by manipulation of the handle 22. A plate 24 is provided in position to overlap the opening along the line 21. A feed tube 25, having an inside diameter approximately that of the opened cartridge, is adapted to support the cartridge on its upper end. Lugs 26 on the upper end of the feed tube 25 are adapted to properly position the cartridge,

the closed cartridge fitting loosely within the lugs, as shown at 27, but the expanded cartridge fitting snugly within them. Any suitable means, such as shown at 28, are provided for suspending a bag 29 from the lower end of the feed tube 25.

The manner in which our process is carried out with the aid of the apparatus shown is as follows:—

Any desired pulverulent material 30 is fed through the spout 11 into the casing 10, and is pressed down by the compacting auger against the support 17. The support 17 is mounted in any suitable manner so that it will yield when the desired amount of pressure is exerted thereagainst. This pressure is so regulated that the material will be temporarily bonded as it is forced out of the casing 10 against the support 17 and into the cartridge 16. This bonded charge 31 within the cartridge will be provided with a central opening 32 where it is forced down around the rod or shaft 15. When pulverulent material, such as flour, dehydrated lime, etc., is compacted under pressure and with opportunity for the escape of air, a temporary bond is formed, so that a bonded charge may be formed in this way that will stand by itself without change of shape, and which may be even whittled or carved with care without causing it to fall to pieces. At the same time, any considerable jar will entirely destroy the bond so that the particles are once more in their loose separated condition. In the apparatus shown, sufficient pressure is provided by the compacting auger and there is opportunity for air to escape along the walls of the casing and the blade of the auger up through the material and, in the construction shown, out through the opening 33.

The filled cartridge is placed on the upper end of a feed tube, and a container, such as the bag 29, is positioned at the lower end of the feed tube. The cartridge is then opened and the bonded charge is dropped through the feed tube into the container. It is highly desirable to drop the charge from such a height that when it encounters the bottom of the container the bond will be destroyed and the charge will assume the form of the container.

It is necessary to provide some way of escape for the air beneath the falling charge.

In the construction shown, this way of escape is provided by the opening 32. Such escape might be provided by forming a bonded charge having any shape in cross-section with less area than that of the container for which it is intended, but, where the compacting is done by means of a compacting auger, the material will be less thoroughly compacted at the center than adjacent the circumference and for this reason the necessary vent may be provided along the axis of the cylindrical bonded form with less resultant lengthening of the form than would be the case if the vent were at any other point, and this construction also has the advantage of having the vent centrally located. It is to be understood that any other means of compacting may be employed, as the invention relates to the compacting and not to the apparatus by which it is accomplished. It is old to pack material directly into bags by means of a screw compactor. In such a process the force which can be applied is limited by the strength of the bag, whereas by our process the cartridge may be made as strong as necessary to withstand the pressure exerted by any packing means which it is found desirable to employ. Ordinarily the bulk of pulverulent materials is greatly increased by entrapped air. By our process we eliminate much of this entrapped air and therefore, we can pack such materials as flour into a space about two-thirds that ordinarily occupied by charges of equal weight.

By dropping the charges in the manner described, the bond which holds the compacted form in shape is broken when the charge encounters the bottom of the container, and the charge assumes the shape of the container as the bond is broken progressively from the bottom of the bonded charge to its top. In this way the charge assumes the shape of the container without trapping air, and therefore may be packed in a comparatively small container. At the same time, the packed material is in the desired powdery condition, and not caked or lumpy as a result of its consolidation.

This manner of introducing the charge into the container is especially advantageous when the container is a bag made of such material as cloth or crêpe paper, which is more or less elastic. When the charge is dropped into such a bag, the momentum of the material stretches the walls of the bag at the very instant when the bond is broken and the charge assumes the shape of the bag. In that way, the stretched bag is completely packed with material that has had a large part of the entrapped air removed therefrom.

While we have described the application of our process to the compacting of pulverulent material, such as flour, by means of a

compacting auger, and the dropping of the compacted form into bags having elastic walls of such material as cloth or crêpe paper, it will be understood that the process is capable of wide application and that various changes may be made within the scope of the appended claims without departing from the spirit of the invention.

What we claim is:

1. The process of packaging pulverulent material, which consists in temporarily bonding a charge of such material by compaction and then positioning the bonded charge within a container.

2. The process of packaging, which consists in bonding a charge of material, positioning the bonded charge within a container and destroying the bond within the container.

3. The process of packaging pulverulent material, which consists in bonding a charge of such material by compaction, then positioning the bonded charge within a container and destroying the bond within the container.

4. The process of packaging, which consists in bonding a charge of material and depositing the bonded charge in a container with such force that the bond is destroyed when the charge encounters the container.

5. The process of packaging pulverulent material, which consists in bonding a charge of such material by compaction and depositing the bonded charge in a container with such force that the bond is destroyed when the charge encounters the container.

6. The process of packaging, which consists in bonding a charge of material into a form having a cross-section less in area than the cross-section of the container for which it is intended and depositing the bonded charge in the container with such force that, when the end of the charge encounters the bottom of the container, the bond is broken progressively from the bottom to the top of the charge.

7. The process of packaging pulverulent material, which consists in bonding a charge of such material by compaction and removal of air therefrom and depositing the bonded charge in a container with such force that, when the end of the charge encounters the bottom of the container, the bond is broken progressively from the bottom to the top of the charge, the bonded charge being of such shape that air may pass upward from beneath the bonded charge as it is deposited in the container, and upward around the bonded portion as the bond is progressively destroyed.

8. The process of packaging, which consists in bonding material into a tubular charge and depositing the bonded charge in a container with such force that, when the end of the charge encounters the bottom of

the container, the bond is broken and the charge assumes the shape of the interior of the container.

9. The process of packaging pulverulent material, which consists in bonding such material into a hollow cylindrical charge in such a way that the material adjacent the circumference of the cylinder is more compact than that nearer its center, and positioning the bonded charge within a container and destroying the bond within the container.

10. The process of packaging, which consists in bonding a charge of material, holding a bag in such a way that its walls may be stretched by pressure from within, and positioning the bonded charge in the held bag with such speed that, when the charge encounters the bag, the bond is broken, the charge assumes the form of the bag and the momentum of the material stretches the walls of the bag.

11. The process of packaging pulverulent material in bags of elastic fabric, which consists in bonding a charge of such ma-

terial, holding a bag of elastic fabric in such a way that its walls may be stretched by pressure from within, and positioning the bonded charge within the held bag with such speed that, when the charge encounters the bag, the bond is broken, the charge assumes the form of the bag and the momentum of the material stretches the walls of the bag.

12. The process of packaging pulverulent material in crêpe paper bags, which consists in bonding a charge of such material in the form of a hollow cylinder, holding an otherwise unsupported crêpe paper bag by its mouth, and dropping the bonded charge into the held bag from a height so great that the encounter of the charge with the bottom of the bag breaks the bond and allows the charge to assume the form of the bag and that the momentum of the material stretches the walls of the bag.

In testimony whereof we have hereunto signed our names to this specification.

ADELMER M. BATES.
JOHANN E. DANCKER.