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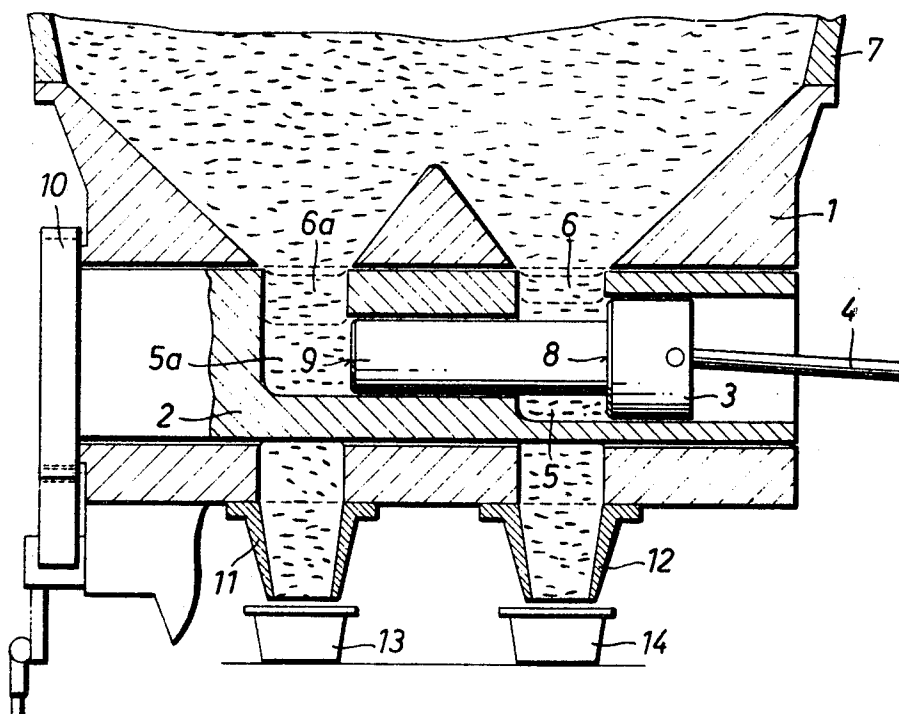
[54] **A DOSING DEVICE WITH A ROTATING PISTON CYLINDER**
3 Claims, 2 Drawing Figs.

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ABSTRACT: A filling device for filling in doses of soft-plastic material with a piston, which comprises a filling housing and a dosaging cylinder rotatably mounted in the housing and alternately into a filling position and an emptying position. A piston reciprocates in the cylinder and is divided by at least one portion of larger diameter and a portion of smaller diameter into a stepped-up piston. The inner surface of the cylinder is stepped down complementary to the stepped-up piston. The stepped-up piston defines in the cylinder an annular chamber at the end face of the portion of the piston having a larger diameter and a cylindrical chamber at the end of the portion of the cylinder having smaller diameter. The filling housing has a filling opening within the range of the chambers, and the cylinder has a lateral opening within the range of the annular chamber and the cylindrical chamber, respectively, thereby providing alternately communication with the housing for filling the chambers and with the opening in the housing, respectively, for emptying the cylinder, depending upon the position of the cylinder.



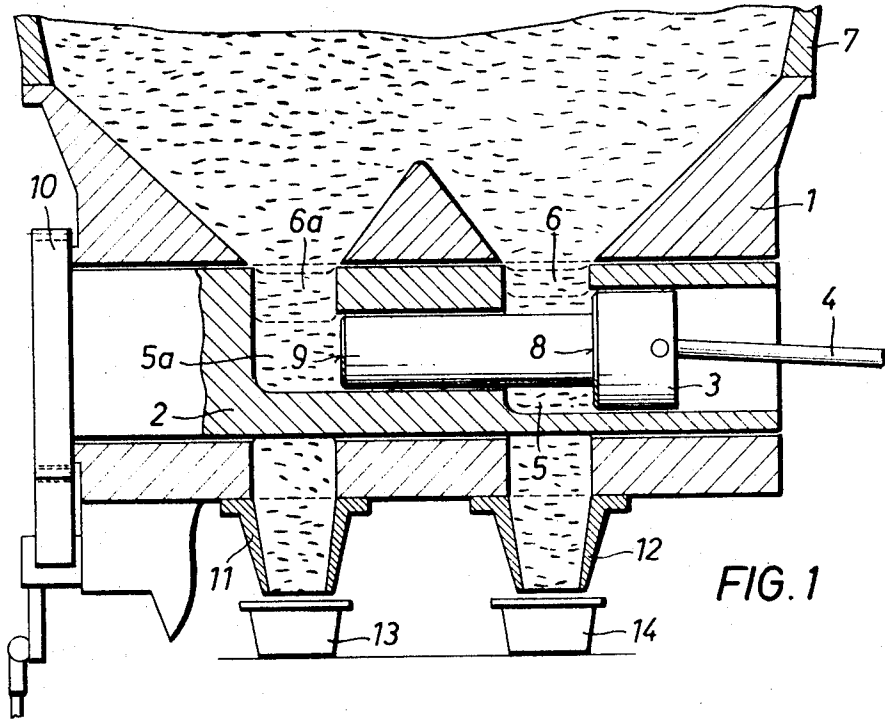


FIG. 1

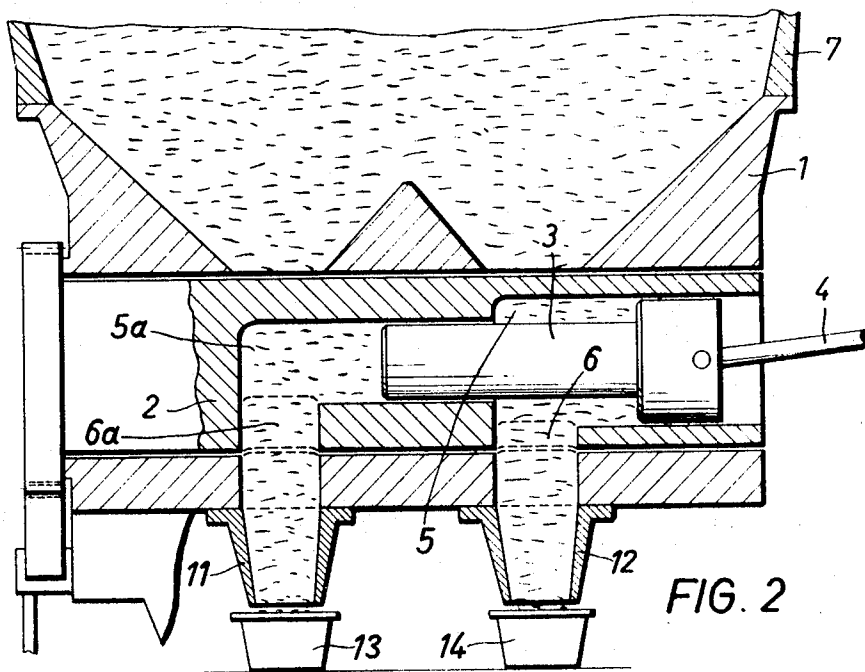


FIG. 2

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A DOSING DEVICE WITH A ROTATING PISTON CYLINDER

The present invention relates to a dosing device, in general, and to filling devices for dosed filling of soft plastic material with a piston, which is mounted axially displaceable in a rotary cylinder equipped with an opening and switchable alternately for filling and emptying.

Volume dosing of this type has been known for some time. Such devices comprise substantially a filling housing fed from the outside with the material, in which filling housing is rotatably mounted a dosing cylinder, which is equipped with a jacket opening. In this dosing cylinder is axially displaceably provided a dosing piston for suction and pressing out. By a coordinated rotary and transverse movement, respectively, of the cylinder and of the piston, a volume filling exactly to its weight is obtained, on the one hand, by suction and, on the other hand, by pressing out of the material. In order to bring about an increase of the filling output, it is known, among other means, to arrange two such cylinder piston systems parallel relative to each other, the pistons of which are displaced jointly and simultaneously by means of a double lever.

It is one object of the present invention to provide a dosing device, to create a simpler and more economical dosing device, for the purpose of an output increase.

It is another object of the present invention to provide a dosing device, wherein the piston is divided by a diameter change into a stepped-up piston, which is arranged in the similarly stepped-down rotary cylinder such, that at least a circular ring space and at the end of the piston a cylinder chamber is created, within the range of which a jacket opening is provided which serves as inlet opening and outlet opening, respectively. By selection of the ratio of the free piston end faces relative to each other the possibility results, to fill equal or nonequal volumina simultaneously.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings, in which:

FIG. 1 is a vertical section of the dosing cylinder mounted in the filling housing and the stepped-up piston arranged in the dosing cylinder in the position prior to the suction operation; and

FIG. 2 is a vertical section, similar to that shown in FIG. 1, however, the piston and cylinder position, respectively, being shown at the start of the pressing out of the material.

Referring now to the drawing, the filling device comprises a filling housing 1 and a rotary cylinder 2 rotatably mounted in the filling housing 1. A stepped-up piston 3, reciprocated by a piston rod 4, is arranged axially displaceable in the rotary cylinder 2. A storage container 7 receiving the material to be dosed is provided on the filling housing 1. A conventional shifting drive 10 is provided for rotation of the cylinder 2. For filling the material into containers 13 and 14, the filling device applies two mouth pieces 11 and 12, extending from the filling housing 1 in communication with openings in the latter, and the containers 13 and 14 are disposed adjacent the mouth pieces 11 and 12, respectively.

The working cycle of the filling device can be divided into a suction phase and a press-out phase. The suction phase starts

with a return stroke of the stepped-up piston 3 from the position disclosed in FIG. 1 and terminates with the rearmost position of the piston 2, as shown in FIG. 2. At the start of the suction phase, the chambers 5 and 5a are connected by means of the openings 6 and 6a of the rotary cylinder 2, in case of a corresponding position of the rotary cylinder 2 with the dosing housing 1 and the storage container 7, respectively. During the return stroke of the step-up piston 3, the latter being drawn by the piston rod 4, the material present in the storage container 7 will be sucked out from the latter corresponding to the volume of the piston stroke simultaneously in both chambers 5 and 5a. The amount of the sucked-up volume in both chambers 5 and 5a can be equal or different in accordance with the ratio of the circular ring face 8 to the circular face 9 of the step-up piston 3.

By rotation of the rotary cylinder 2 by means of the drive 10 into the position shown in FIG. 2, the press-out phase is started, which terminates with the position of the step-up piston 3, as shown in FIG. 1. During the press-out stroke of the step-up piston 3, the material present in the chambers 5 and 5a is pressed out simultaneously into the containers 13 and 14 to be filled, by means of the connection of the rotary cylinder 2 with the mouth pieces 11 and 12 through the openings 6 and 6a of the filling housing 1. Upon following return rotation of the rotary cylinder 2, a new operation cycle starts with suction phase and a press-out phase.

While we have disclosed one embodiment of the present invention, it is to be understood that this embodiment is given by example only and not in a limiting sense.

We claim:

1. A filling device for filling in doses of soft-plastic material with a piston, comprising
 - a filling housing,
 - a dosing cylinder rotatably mounted in said housing and alternately movable into a filling position and an emptying position, respectively
 - a piston reciprocating in said cylinder,
 - said piston being divided by at least one portion of larger diameter and a portion of smaller diameter into a stepped-up piston,
 - the inner surface of said cylinder being stepped down complementary to said stepped-up piston,
 - said stepped-up piston defining in said cylinder an annular chamber at the end face of the portion of said piston having a larger diameter and a cylindrical chamber at the end of the portion of said cylinder having a smaller diameter,
 - said filling housing having a filling opening within the range of said chambers, and
 - said cylinder having a lateral opening within the range of said annular chamber and said cylindrical chamber, respectively, thereby providing alternately communication with said housing for filling said chambers and with said opening in said housing, respectively, for emptying said cylinder, depending upon the position of said cylinder.
2. The filling device as set forth in claim 1, wherein said chambers of said cylinder have equal volumes.
3. The filling device, as set forth in claim 1, wherein said chambers of said cylinder are of different volumes.