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SOLID CARBON DIOXIDE CAKE PACKAGING APPARATUS

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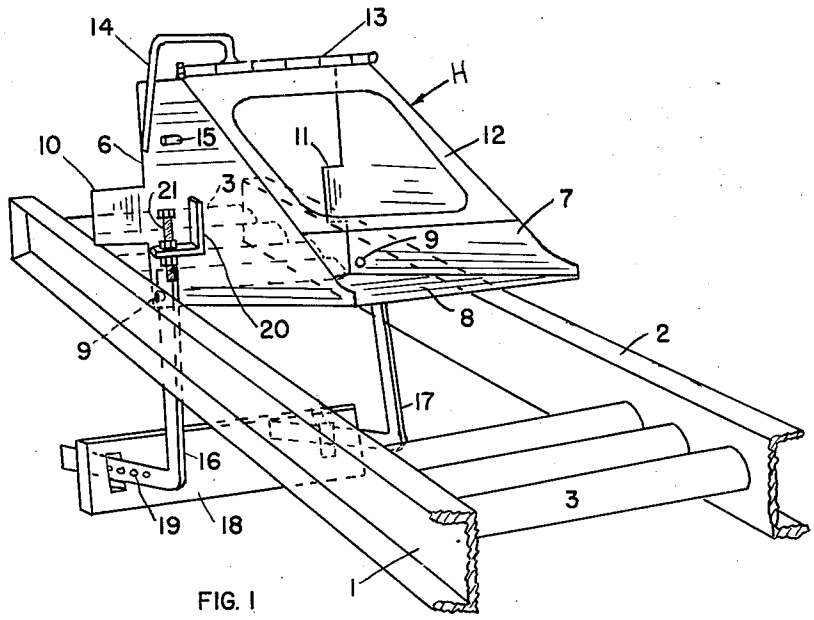


FIG. 1

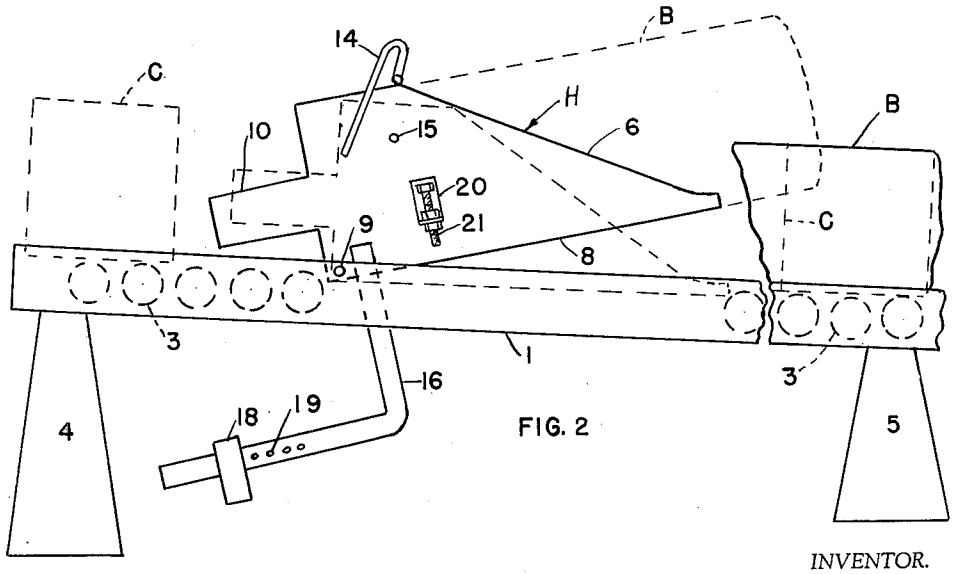


FIG. 2

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SOLID CARBON DIOXIDE CAKE PACKAGING APPARATUS

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5 Claims. (Cl. 226—2)

1

The present invention relates to an apparatus for packaging cakes or blocks of refrigerant such as pressed, solid carbon dioxide, commonly known as "dry ice." Such cakes or blocks, substantially of cubical shape and weighing fifty pounds, are packaged in paper wrappers or bags, for sanitary, safety, handling and storage purposes. Due to the relatively low temperature of such Dry Ice cakes, they cannot conveniently be handled with the bare hands and without some sort of protection, such as heavy gloves. The latter often prove cumbersome to the workman engaged in handling and packaging the Dry Ice cakes.

Furthermore, due to the relatively heavy weight of such cakes or blocks, difficulty has often been encountered during the insertion of same into paper bags because there is the likelihood of tearing or rupturing the bag.

It is, therefore, the general object and nature of my invention to provide a packaging apparatus or machine for inserting the cakes or blocks into a paper bag without necessitating the handling or manipulating of the cakes by the operator, and whereby such insertion is accomplished with a minimum of force and violence so that there is very little likelihood of tearing or breaking the paper bag.

A further object and advantage of my invention is that the Dry Ice cakes or blocks are caused to be moved and inserted into the interior of the previously opened bag by reason of their own movement down an inclined plane.

A further object and advantage of my invention is to provide a bag holder and filling device which is relatively simplified in construction, requires no power of operating mechanism, and is movable from a bag receiving position to a bag filling and packaging discharge position, the latter position being in alignment with the inclined plane down which the cake or block is caused to move.

Additional objects and advantages of my invention become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends and to enable any person skilled in the art readily to understand and practice the invention, the following full and concise description and annexed drawing set forth the best mode in which I have contemplated applying the principle thereof.

In said annexed drawing Fig. 1 is a perspective view of the apparatus embodying the principle of my invention, and

Fig. 2 is a side elevational view of the same apparatus, with portions broken away and foreshortened for the purpose of convenience in illustration.

Now referring more particularly to the drawing, the apparatus shown therein comprises a

2

roller conveyor having the side frame members 1 and 2 which in turn carry the conveyor rollers 3. Such roller conveyor is mounted at a slight angle to the horizontal, such as being supported upon the base members or standards 4 and 5. The upper or left hand end of the conveyor is adapted to receive the unpackaged Dry Ice cake or block, such as indicated at C, and the latter is adapted to travel by its own weight down the length of the conveyor, to become inserted in the paper bag B and finally delivered on the lower end of the conveyor in the form of the cake C enclosed in the bag B, whereupon the mouth of the bag B can be simply folded over and closed, sealed in a suitable manner such as by the application of gummed tape, thus producing the finished package.

The insertion of the cake C in the bag B is accomplished by means of the parts of the mechanism now to be described. A rectangularly, or box-shaped, housing or bag holder, indicated generally at H, and having the side walls 6 and 7 and the bottom wall 8, is pivotally mounted at 9, 9 to the conveyor side frames 1 and 2. The internal dimensions of the housing H are such as to receive the cake C. Outwardly flaring guide plates 10 and 11, mounted on the upper or entrance end of the housing H, project from the side walls 6 and 7 and aid in guiding the cake C into such housing.

A flap 12 is hinged at 13 to the top of the housing or bag holder H and normally occupies the position as shown in Fig. 1 where it is in alignment with the sloping edges of the side walls 6 and 7. A hand lever 14 is rigidly connected to the flap 12 through the hinge 13, whereby the flap 12 may be moved or swung in an upward direction in a position parallel to the bottom wall 8 of the bag holder H. A stop pin 15 projecting from the side wall 6, determines the extent of movement of the lever 14 and correspondingly of the flap 12.

L-shaped arms 16 and 17 are secured to the side walls 6 and 7, respectively, of the housing or bag holder and at a point adjacent the pivots 9. A counterweight 18 is carried on the lower portions of the L-shaped arms 16 and 17 and is adjustable to the desired position by suitable means, such as by the use of set screws or pins passing through the holes 19. The counterweight 18, occupying a position on the opposite side of the pivots 9 to that of the body of the bag holder H, is adapted normally to hold and balance the bag holder in its upwardly tipped position as shown in solid lines in Fig. 2. The entrance of the cake C into the bag holder H overcomes the effect of the counterweight 18 and swings or tips the bag holder down into the position shown in dotted lines in Fig. 2 where it is in alignment with the plane of the conveyor. A bracket 20 carrying an

adjustable screw 21 is adapted to limit the downward movement of the bag holder H, by reason of the lower end of the screw 21 contacting with the upper side of the frame member 1.

The operation of the above described apparatus should now be fairly well apparent. The paper bag, indicated by the dotted lines B in Fig. 2 is inserted over the right hand end of the bag holder H, viz: around the walls 6, 7 and 8, and by manipulation of the lever 14, the flap 12 is swung to open the bag B to a fully opened position. The cake C, such as might be delivered from the hydraulic press or another conveyor (not shown), then goes down the roller conveyor into the mouth of the bag holder H and into the bag B, simultaneously tipping or pivotally swinging the bag holder to the dotted line position shown in Fig. 2. If necessary, the rate of the movement of the cake C may be slightly retarded or braked by manipulation of the lever arm 14 and flap 12. The bag B and cake C then continue to move down the roller conveyor as shown in the right hand portion of Fig. 2, with the cake C inserted in the interior of the bag B.

It will be noted that the flight or run of the rollers 3 is discontinuous, thus providing an open space in the conveying portion of the conveyor, and that this open space extends from the upper to the lower end of the bag holder H. That is, the open space in the conveyor is co-extensive with the length of the bottom wall 8 of the bag holder H, and when the latter is swung into a position in alignment with the plane of the roller conveyor, such bottom wall 8 bridges this open space. The purpose of this last described feature of construction, is to permit the bag B and contained cake C to be ejected or slid off from the bottom wall 8, without any impedance or binding action.

Other modes of applying the principle of my invention, in addition to the one hereinabove described and illustrated in detail, may be employed, provided the structural elements stated by any of the following claims or the equivalent of such elements be utilized.

I, therefore, particularly point out and distinctly claim as my invention and discovery:

1. In an apparatus of the character described, the combination of a horizontally inclined roller conveyor, said conveyor having an open space intermediate its ends, and a bag holder adapted to bridge such space and being pivotally mounted adjacent its upper end to said conveyor, said bag holder being pivotally movable from a bag receiving position where it is tipped above such space to a position where it bridges such space in alignment with the plane of said conveyor, such pivotal movement of said bag holder being effected by the weight of the article to be packaged moving into the bag holder.

2. In an apparatus for packaging cakes of solid carbon dioxide and the like, the combination of a horizontally inclined conveyor and a box shaped bag holder pivotally mounted adjacent one end to said conveyor, said bag holder being open at one end for the reception of the cake and having inclined side walls forming a narrow end for the reception of the bag, said bag holder being pivotally movable from a position angularly inclined with respect to the plane of said conveyor to a position with its bottom wall coincident with the plane of said conveyor, such pivotal movement being effected by the weight of the cake moving into said bag holder.

3. In an apparatus for packaging cakes of solid carbon dioxide and the like, the combination of a horizontally inclined conveyor, a box shaped bag holder pivotally mounted adjacent one end to said conveyor, said bag holder being open at one end for the reception of the cake and having inclined side walls forming a narrow end for the reception of the bag, said bag holder being pivotally movable from a position angularly inclined with respect to the plane of said conveyor to a position with its bottom wall coincident with the plane of said conveyor, such pivotal movement being effected by the weight of the cake moving into said bag holder, a flap pivotally mounted on the bag receiving end of said bag holder for spreading the bag after its insertion onto said bag holder and a lever connected to said flap for pivotally moving the latter.

4. In an apparatus for packaging cakes of solid carbon dioxide and the like, the combination of a horizontally inclined conveyor, said conveyor having an open space intermediate its ends, a box shaped bag holder pivotally mounted adjacent one end to said conveyor, the bottom wall of said bag holder being adapted to bridge such space, said bag holder being open at one end for the reception of the cake and having inclined side walls forming a narrow end for the reception of the bag, said bag holder being pivotally movable from a position angularly inclined with respect to the plane of said conveyor to a position with its bottom wall coincident with the plane of said conveyor, such pivotal movement being effected by the weight of the cake moving into said bag holder, and a counterweight connected to said bag holder adjacent its pivot for normally holding said bag holder in such angularly inclined position.

5. In an apparatus for packaging cakes of solid carbon dioxide and the like, the combination of a horizontally inclined conveyor, said conveyor having an open space intermediate its ends, a box shaped bag holder pivotally mounted adjacent one end to said conveyor, the bottom wall of said bag holder being adapted to bridge such space, said bag holder being open at one end for the reception of the cake and having inclined side walls forming a narrow end for the reception of the bag, said bag holder being pivotally movable from a position angularly inclined with respect to the plane of said conveyor to a position with its bottom wall coincident with the plane of said conveyor, such pivotal movement being effected by the weight of the cake moving into said bag holder, a flap pivotally mounted in the bag receiving end of said bag holder for spreading the bag after its insertion onto said bag holder, a lever connected to said flap for pivotally moving the latter, and a counterweight connected to said bag holder adjacent its pivot for normally holding said bag holder in such angularly inclined position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,215,094	De Mars	Sept. 17, 1940
2,393,102	Gribner	Jan. 15, 1946
2,402,869	Buchanan	June 25, 1946
2,403,149	Williams et al.	Nov. 15, 1946