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STOCK DISTRIBUTION SYSTEM

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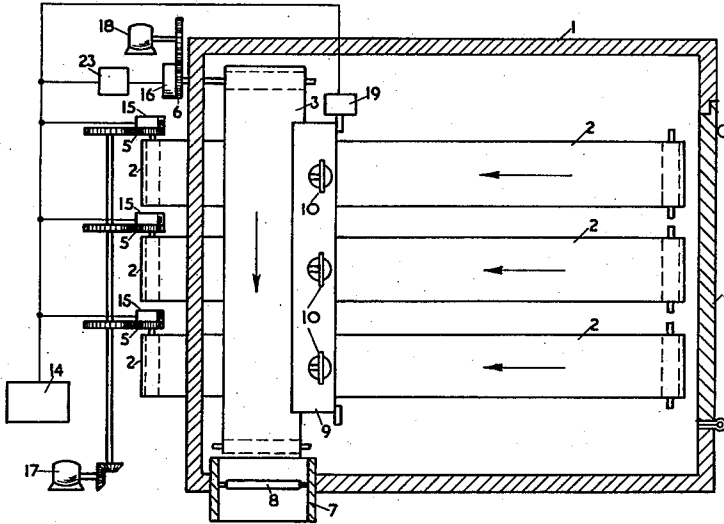


FIG. 1

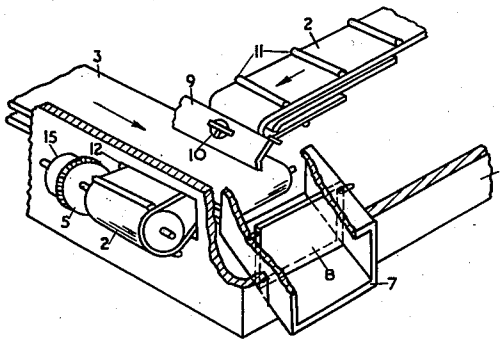


FIG. 2

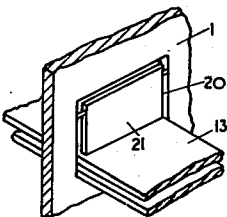


FIG. 3

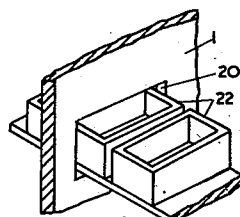


FIG. 4

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STOCK DISTRIBUTION SYSTEM

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11 Claims. (Cl. 62—102)

1.

The invention relates to stock distribution systems and more particularly to such systems in which perishable food has to be dispensed.

Perishable food can be safely stored only in suitable refrigeration chambers and therefore difficulties arise when such food shall be included in an article dispensing system.

According to the invention the dispensing system includes a refrigeration chamber which contains means for the storage of articles and for the automatic release of articles selected therefrom. Furthermore means are provided for joggling stored articles to avoid freezing together and conveyor means are used to convey released articles from the refrigeration chamber to a predetermined locality.

It is a further feature of the invention to store the articles in a refrigeration chamber on movable belts and to arrange the driving means for these movable belts as well as for conveyor means common to a plurality of movable belts outside the refrigeration chamber, to avoid a freezing up.

It is another feature of the invention to arrange a collector belt inside the refrigeration chamber and to discharge articles selected from movable storage belts through a chute arranged in one wall of the refrigeration chamber. This chute is normally closed by a flap to avoid the entrance of warm air into the refrigeration chamber.

According to a further feature of the invention the movable belts inside the refrigeration chamber are started in predetermined time intervals to avoid a freezing up of the mechanism and a freezing of the articles to the belts and to each other. For this purpose the storage belts are provided with cleats and special arrangements are made to avoid any ejection of the articles when the belts are started. The storage belts glide underneath the articles and the cleats on these belts convey a rocking or joggling movement to the articles, thus avoiding freezing together of articles and belts.

It is still another feature of the invention to provide a rubber envelope enclosing the contact arrangements in the refrigeration chamber. This rubber envelope which is air-tight ensures that the contacts are not affected by the cold.

These and other features of the invention will be apparent from the following description which refers to an embodiment of the invention and two modifications illustrated by way of example in the accompanying drawings in which:

Fig. 1 shows schematically a cross-section

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through a refrigeration chamber according to the invention,

Fig. 2 shows details of this arrangement.

Fig. 3 and Fig. 4 show two modifications of the common conveyor means shown in Fig. 1.

In Fig. 1 a refrigeration chamber 1 contains three movable belts 2 on which articles are stored and which work together with a common collector belt 3. It must be understood that the number of movable belts in the refrigeration chamber depends solely on the size of the refrigeration chamber and the number of various kinds of articles to be stored on the movable belts.

The refrigeration chamber 1 is provided with a door 4 which opens at the back of the belts 2 to enable an easy re-loading of the movable belts. The movable belts 2 are guided underneath the collector belt 3 and brought out through openings in the wall of the refrigeration chamber to appropriate driving means 5 so that each movable belt can be individually connected, for example, by a clutch 15 with a common driving means 17. The driving means 6 for the collector belt 3 can be connected by a clutch 16 with a motor 18 or the common driving means and is also arranged outside the refrigeration chamber.

The collector belt 3 ends over a chute 7 mounted in one wall of the refrigeration chamber and normally closed by a flap 8. Flap 9 connects the movable belts 2 with the common collector belt 3 and carries contact arrangements 10 which are operated whenever articles from a movable belt 2 are released to the collector belt 3. Each contact arrangement 10 is preferably mounted at the back of flap 9 and is operated by a T-shaped contact spring extending through an orifice in flap 9 into the path of released articles as for example described in my copending Patent No. 2,575,847 which matured from application No. 777,561 filed October 2, 1947, for "Storage Systems."

Details of the arrangement described above are shown in Fig. 2. A movable belt 2 is guided underneath the collector belt 3 through an opening 12 in the wall of the refrigeration chamber and connected with the driving means 5. The opening 12 may be partly closed by flaps of suitable resilient material which permits the movable belt 2 to slide through, but which otherwise restricts air flow into the refrigeration chamber 1.

Belt 2 and belt 3 are connected by the flap 9 bearing the contact arrangement 10 as described in connection with Fig. 1.

As already mentioned the collector belt 3 ends on the chute 7 mounted in one wall of the refrigeration chamber. This chute is normally

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closed by a flap 8 which opens automatically whenever articles are released from the belt 3 into the chute 7.

To avoid a freezing-up of the device in the refrigeration chamber, the storage belts 2 as well as the common conveyor belt 3 are started up by a timing device 14 (Fig. 1) in predetermined intervals. The timing device 14 may, for example, be a clockwork mechanism, a revolving contact drum, or any suitable form of motor driven timer. At the same time flap 9 is automatically raised by an electromagnetically operated device 19 (Fig. 1) so that the articles on storage belt 2 cannot leave this belt and the belt slides underneath the articles. The belt 2 (Fig. 2) is provided with cleats 11 spaced in suitable intervals which when sliding underneath the articles convey a joggling or rocking movement to these articles to avoid freezing together.

The timing device 14 (Fig. 1) disconnects the clutches 15 after a short time thus stopping the movement of the movable belts and at the same time operates device 19 to lower flap 9 so that the whole arrangement is now re-set for working condition.

Flap 9 and the various contacts 10 are preferably enclosed in an air-tight rubber envelope to ensure that the contacts would not get frosted-up.

Many modifications of the arrangement described above are possible without departing from the spirit of the invention. Instead of using a common collector belt arranged totally inside the refrigeration chamber, a collector belt can be used which passes through the walls of the refrigeration chamber as shown in Fig. 3. In this case the opening 20 in the wall of the refrigeration chamber 1 through which the belt 13 passes in both directions is closed by a flap 21 similar to flap 8 in chute 7. To avoid a pumping of hot air into the refrigeration chamber by a permanently running collector belt, this collector belt would only be started when a selection of articles is actually made and otherwise would remain stationary. In this case clutch 16 (Fig. 1) would be operated together with the clutches 15 for the release of articles from the movable belts, and a delaying device 23 (which might for example be a slow-release relay) would ensure a delayed stopping of the common conveyor belt so that the articles selected from the most distant movable belt would be safely discharged.

In Fig. 4 the common collector belt is replaced by a chain of receptacles 22 linked and moving together. The opening 20 in the wall of the refrigeration chamber 1 is just big enough to let the receptacles 22 pass so that the latter close the opening 20 against the entry of warm air into the refrigeration chamber 1.

It is obvious that other modifications can be made within the scope of this invention.

I claim:

1. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point; a plurality of independently operable storage and releasing means in said chamber for the storage of articles and for their selective release, each said storage and releasing means including a movable member for supporting articles of one kind, selectively operable driving means for selectively moving said member to release an article therefrom and means for joggling said stored articles to prevent their freezing to each other and to said storage and releasing means;

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and conveying means associated with said storage and releasing means to convey released articles from said refrigeration chamber to a predetermined locality.

2. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point; a plurality of movable belts in said chamber for the storage of articles thereon, each of said movable belts being provided with cleats to convey a rocking movement to said articles, when said belts pass underneath said articles; driving means for each of said belts selectively operable for the release of said articles from said belts; and means operable to stop the release of articles from said belts while said belts are in motion.

3. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point and including a plurality of movable belts for the storage of articles thereon; means for joggling said stored articles; driving means for said movable belts arranged outside said refrigeration chamber and adapted for the selective movement of any of said movable belts; conveying means in said refrigeration chamber common to a plurality of said movable belts and adapted to convey articles released from said belts to a predetermined locality; and driving means for said conveying means arranged outside said refrigeration chamber and operable simultaneously with the said driving means of any of said movable belts.

4. In a system for dispensing articles a refrigeration chamber as claimed in claim 3, said refrigeration chamber being fitted with a door opening at the back of said movable belts where the upper parts of said belts moving to the middle of said chamber are freely accessible to facilitate loading of said belts.

5. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point and including a plurality of movable belts for the storage of articles and for their selective release therefrom; means for joggling said stored articles; conveying means common to a plurality of said movable belts to convey articles released from said movable belts to a predetermined locality; and driving means for said movable belts arranged outside said refrigeration chamber and adapted for the selective movement of any of said movable belts, said movable belts being guided underneath said conveying means through openings in a wall of said refrigeration chamber for connecting said belts with said driving means.

6. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point and including a plurality of movable belts for the storage of articles thereon; means for joggling said stored articles; a collector belt passing said movable belts, driving means for said movable belts and said collector belt arranged outside said refrigeration chamber, said movable belts passing underneath said collector belt through openings in a wall of said refrigeration chamber; flaps of resilient material partly closing said openings; and a chute mounted in one wall of said refrigeration chamber opposite said collector belt and including a hinged flap, normally closing said chute and adapted to be raised by articles discharged from said collector belt through said chute.

7. In a system for dispensing articles a refrig-

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eration chamber adapted to maintain the inside temperature at least at freezing point and including a plurality of movable belts for the storage of articles thereon; means for joggling said stored articles; a collector belt common to a plurality of said movable belts; driving means for said movable belts and said collector belt arranged outside said refrigeration chamber; said collector belt passing through an opening in a wall of said refrigeration chamber, said opening being closed by a movable flap adapted to be raised by articles conveyed by said collector belt.

8. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point and including a plurality of movable belts for the storage of articles thereon; means for joggling said stored articles; conveying means common to a plurality of said movable belts, and consisting of a series of receptacles linked together; driving means for said movable belts and said conveying means arranged outside said refrigeration chamber; and an opening for said conveying means in a wall of said refrigeration chamber, said opening having the same shape as the sides of said receptacle.

9. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point; a plurality of movable belts in said chamber for the storage of articles and for their selective release therefrom; means for joggling said stored articles; conveying means common to a plurality of said movable belts to convey articles released from said belts to a predetermined locality; a flap arrangement hinged across a plurality of said movable belts and connecting said movable belts with said conveying means and including electrical contacts mounted on said flap opposite each of said movable belts and operable by articles released from said movable belts; and an airtight resilient envelope enclosing said flap with said electrical contacts.

10. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point; a plurality of movable belts in said chamber for the storage of articles thereon, each of said belts being provided with cleats to convey a rocking movement to said articles when said belts pass

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underneath said articles; conveying means passing said movable belts; driving means for said movable belts and said conveying means; a flap hinged across a plurality of said movable belts and in its normal position sloping down from said movable belts to said conveying means; means to automatically start and stop the driving means for said movable belts at predetermined time intervals to eliminate freezing up; and further means associated with said flap to raise said flap when said movable belts are started and to lower said flap when said movable belts are stopped again.

11. In a system for dispensing articles a refrigeration chamber adapted to maintain the inside temperature at least at freezing point, a plurality of movable belts in said chamber for the storage of articles and for their selective release therefrom, each of said movable belts being provided with cleats; conveying means common to a plurality of said movable belts to convey articles released from said belts to a predetermined locality; driving means for said movable belts and said conveying means; means to automatically start and stop the driving means of said conveying means depending on the operation of the driving means of said movable belts; and further means for delaying the stopping of the driving means of said conveying means for such a time period that articles released on to said conveying means from the movable belts most distant from the point of delivery are safely discharged from said conveying means.

THOMAS SAMUEL SKILLMAN.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,645,694	Esgro	Oct. 18, 1927
1,975,973	Rairden	Oct. 9, 1934
2,024,675	Worrall	Dec. 17, 1935
2,071,770	Shield	Feb. 23, 1937
2,276,294	Farmer	Mar. 17, 1942
2,300,229	Knowles	Oct. 27, 1942
2,353,638	Beaulieu et al.	July 18, 1944
2,416,870	Farmer	Mar. 4 1947