May 14, 1940. J. L. KOZAK 2,200,507

ELEVATOR BUCKET

Filed Dec. 5, 1938

Fig. 1.

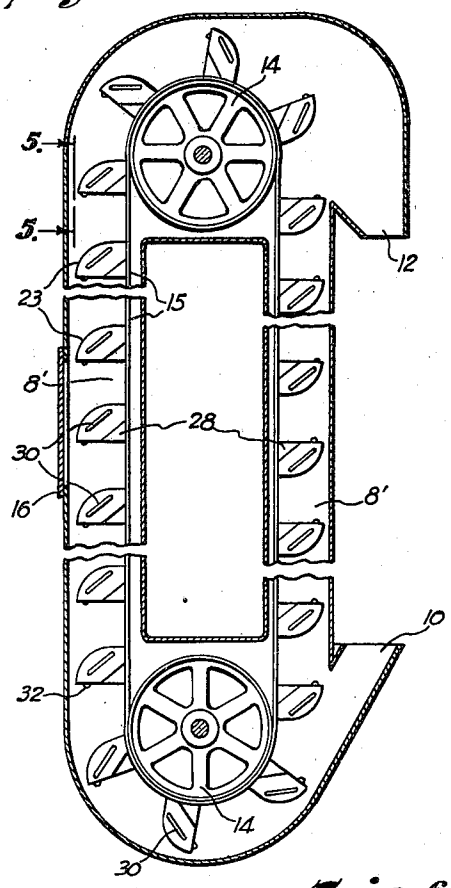


Fig. 2.

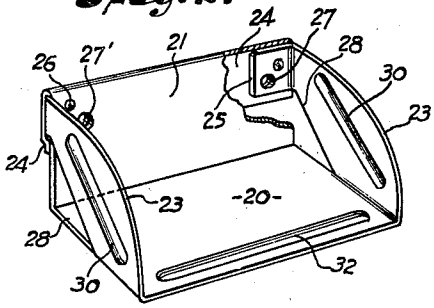


Fig. 3.

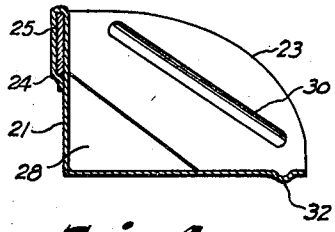


Fig. 4.

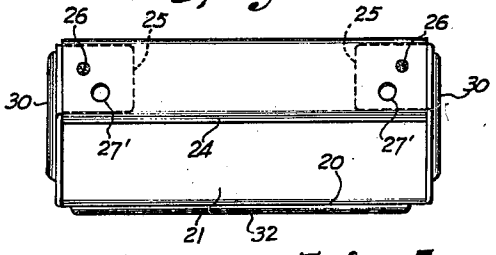


Fig. 6.

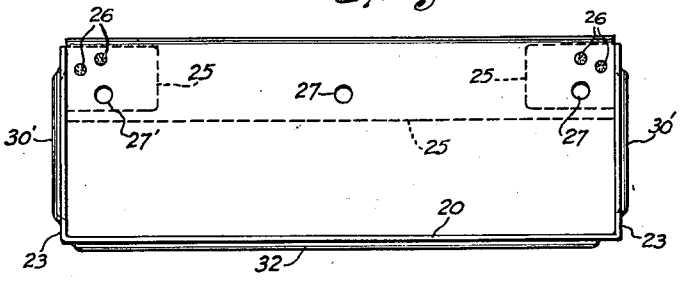


Fig. 5.

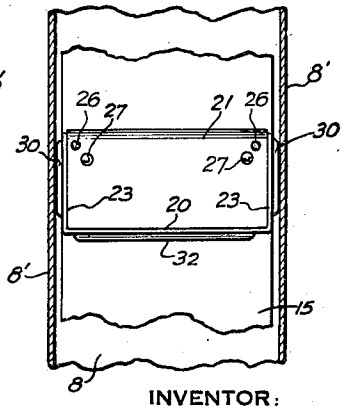
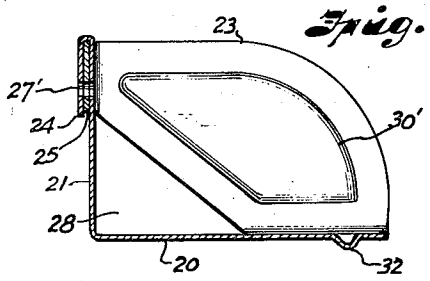


Fig. 7.



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ELEVATOR BUCKET

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Application December 5, 1938, Serial No. 244,070
In Canada December 9, 1937

3 Claims. (Cl. 198—152)

The present invention relates to elevators or conveyors of the type using buckets or like receptacles for carrying the material to be elevated or conveyed, the buckets being attached to an endless belt operating around suitable wheels or pulleys at the opposite ends of the apparatus.

The object of the invention is to provide certain improvements, particularly in the bucket structure, for not only facilitating the more efficient discharge of the buckets, with cleaner operation and saving in power, but also to provide a reinforcing feature which in addition to strengthening the bucket may also serve as guiding means for ensuring correct travel of the buckets as well as preventing undue friction on the belt or damage due to the fraying of the belt edges in its travel through the elevator or conveyor housing.

With this general object in view the invention will now be described by reference to the accompanying drawing illustrating a practical embodiment of the proposed improvements, after which those features and combinations deemed to be novel and patentable will be particularly set forth and claimed.

In the drawing—

Figure 1 is a vertical sectional elevation (with portions broken away) of an elevator construction embodying the present features of improvement in the bucket structure;

Figure 2 is a front perspective view of one of the buckets (on a larger scale and with one of its corner portions partly broken away;

Figure 3 is a transverse sectional view of one of the buckets, on a still larger scale;

Figure 4 is a rear elevation of the bucket, shown in Figures 2 and 3;

Figure 5 is an enlarged sectional view, representing a section taken on the line 5—5 of Figure 1;

Figure 6 is a front elevation of a larger size of bucket having the improvement embodied therein; and

Figure 7 is a transverse sectional view of the bucket shown in Figure 6.

Referring now to the drawing in detail, the elevator apparatus is illustrated as comprising a housing 8 having a receiving opening 10 and a discharge outlet 12 and enclosing an elevator comprising a pair of upper and lower pulleys 14 around which travels an endless belt 15 provided with a series of elevator buckets of the type more particularly illustrated in Figures 2, 3 and 4. Any appropriate driving means (not shown) may be provided for driving one of the pulleys 14, and one or more doors 16 for inspection purposes may also be provided at suitable points.

The buckets are constructed in the form of an open shelf type adapted to be made up from a single piece of suitable sheet metal, stamped and formed to provide a horizontal bottom 20, a vertical back wall 21 at the rear edge of said bottom, and side walls 23 at each end of the bottom,—the top of the back wall having a marginal flange 24 adapted to be folded back and over the angularly bent terminals 25 of the side walls 23 at the rear upper corners of the bucket (see Figure 2), and spot-welded thereto, as indicated at 26. These corners are also provided with openings 27' for securing the buckets to the belt 15 as by means of rivets 27 extending through said openings 27', as will be readily understood—see Figure 5.

In the construction of the side walls 23, said walls are cut away at the angle between the bottom 20 and back wall 21 to provide rear corner vent openings 28, for a purpose hereinafter explained, and each of the side walls is further stamped to provide a rib or corrugation 30 extending substantially parallel to the adjacent edge of the corresponding vent opening 28, as clearly shown in Figure 4. Moreover, the bucket is further strengthened or reinforced by means of a suitable rib or corrugation 32 formed in the bottom 20 and extending parallel and adjacent to the front edge of the bucket bottom, as illustrated in Figure 2. Also in some operations of the apparatus, as where the material should be fed to the buckets between the points 10 and 12 at a somewhat higher point than illustrated, the "shelf" type of the buckets serves to confine the material fairly effectively between the successive buckets, with the ribs or corrugations helping to retain the material upon the outer faces of the bucket-bottoms during such operation.

With the improved construction as above described it will be seen that the buckets, being of the open shelf type with no front wall to obstruct the outflow of the material, will readily and freely discharge their contents into the discharge passage or outlet 12—as indicated in Figure 1. This discharge operation of the contents, en masse, from the buckets is further ensured by virtue of the vent openings 28 which permit free movement of air into and out of the buckets, besides preventing trapping of air in the buckets, which trapped air would of course prevent efficient charging of the buckets with the material being handled and also produce a suctional action (particularly in passing through the down

leg of the elevator) tending to interfere with the proper discharge operation at the outlet passage 12. This feature of permitting free movement of air through the vent openings of the buckets also eliminates undue air currents in the housing 8, known as "blowing" (with the common closed form of bucket), so that the operation of the improved construction not only prevents the apparatus from becoming clogged but also promotes a cleaner and more dust-free operation of the elevator. Consequently, the suction connections which are, in practice, connected with the housing 8 do not have to apply so high a degree of suction for removing dust, and less material is therefore wasted and of course less moisture is removed from the material (such as flour) as a result. The provision of the vent openings in the buckets also prevents pocketing of dangerous explosive gases, and further facilitates the proper fumigation of the equipment as required from time to time.

The construction of the buckets with the ribs or corrugations 30 and 32 provides a reinforcing means, rendering the bottom and side walls stronger and more rigid, which enables lighter stock to be used in its manufacture as well as lighter belting for the elevator and a saving of power required for the operation of the apparatus. In this connection the ribs or corrugations 30 of the side walls also operate as spacing or guiding means between the buckets and the side walls 8' of the elevator housing 8, producing clearance for venting action of openings 28, causing the buckets to travel true and evenly and also protecting the edges of the belt 15 from rubbing against the side walls 8' and thereby reducing friction and keeping the belt edges from becoming unduly worn and frayed.

It is also apparent that where an elevator or conveyor apparatus is employed with the aforesaid features of improvement, the greater efficiency as regards the more complete discharging action of the buckets and corresponding elimination of any recirculation of the material due to incomplete discharge of the buckets, serves to correspondingly increase the capacity of the apparatus in addition to the savings effected due to the elimination of the "blowing" action common to closed bucket constructions as above referred to. The open shelf form of the buckets as well as their lighter construction also enables the buckets to be spaced more closely together for increasing the capacity under some circumstances.

Figures 6 and 7 show the same improved feature carried out with reference to larger size buckets, the construction of which is in all respects substantially the same, excepting as regards the formation of the reinforcing feature. In these larger sizes this reinforcing and spacing feature may be produced by stamping the ends with a boss-like projection 30', thereby affording reinforcing areas of larger extent in the ends of the bucket and at the same time providing the equivalent of the ribs 30 of the construction already described. That is to say, the reinforcing bosses or projections 30' not only reinforce the ends of the bucket but also function as spacing means to space said ends from the side walls 8' and also to provide the necessary clearance with reference to the vent openings 28, to ensure the proper and efficient venting action of said openings.

While I have illustrated and described what I have found to constitute satisfactory and efficient forms of construction which are suitable for the embodiment of the described features of my improvements, it is also obvious that various changes, modifications or substitutions are quite possible within the spirit and scope of the actual invention; I therefore desire to be understood as reserving the right to make all such changes as may fairly fall within the scope of the appended claims.

What I claim and desire to secure by Letters Patent is:

1. An elevator bucket for endless carrier belts operating within conveyor housings having side walls traversed by the sides of the bucket, comprising a horizontal bottom, an upwardly projecting back wall at the rear edge of said bottom, and side portions provided with air vent openings at the corresponding sides of the bucket in position for traversing the inner faces of the side walls of the conveyor housing, said side portions also having outwardly extending projections for reinforcing said side portions and also insuring proper clearance for facilitating the venting function of said air vent openings.

2. An elevator bucket for endless carrier belts operating within conveyor housings having side walls traversed by the sides of the bucket, comprising a horizontal bottom, an upwardly projecting back wall at the rear edge of said bottom, and side portions cut away at the angle between said bottom and back wall to provide rear corner air vent openings at the sides of the bucket in position for traversing the inner faces of the side walls of the conveyor housing, said portions being also stamped with outwardly projecting portions for reinforcing said side portions and also insuring proper clearance for facilitating the venting function of said air vent openings.

3. An elevator bucket for endless carrier belts operating within conveyor housings having side walls traversed by the sides of the bucket, comprising a horizontal bottom, an upwardly projecting back wall at the rear edge of said bottom, and side portions forming side walls with rounded upper front corners and leaving the front of the bucket entirely open, said side walls also having air vent opening in position for traversing the inner faces of the side walls of the conveyor housing and provided with outwardly extending projections for reinforcing said side portions and insuring proper clearance for the venting action of said air vent openings.

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