

Nov. 2, 1943.

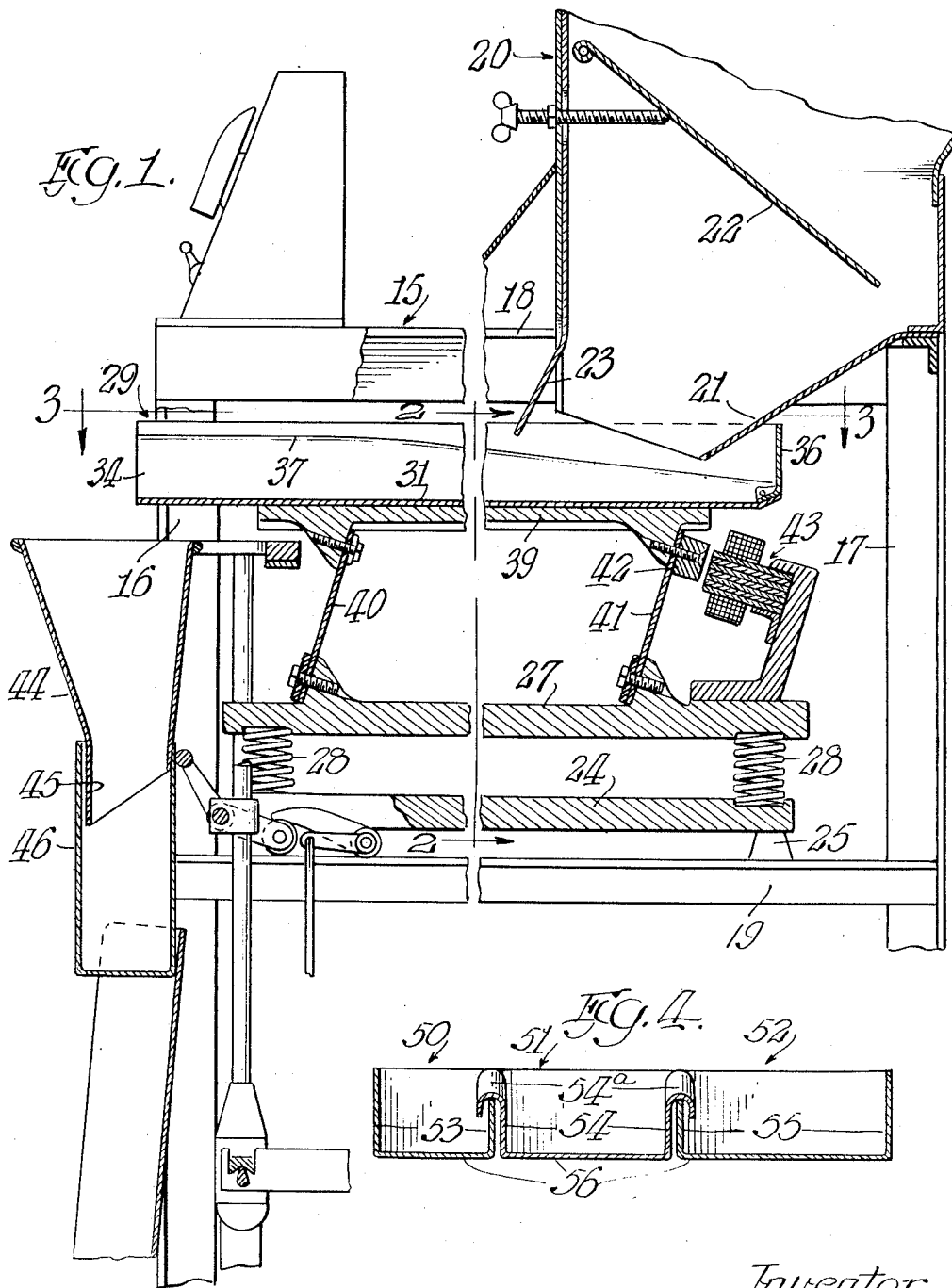
L. R. MUSKAT

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VIBRATILE CONVEYER

Original Filed Nov. 2, 1940

2 Sheets-Sheet 1



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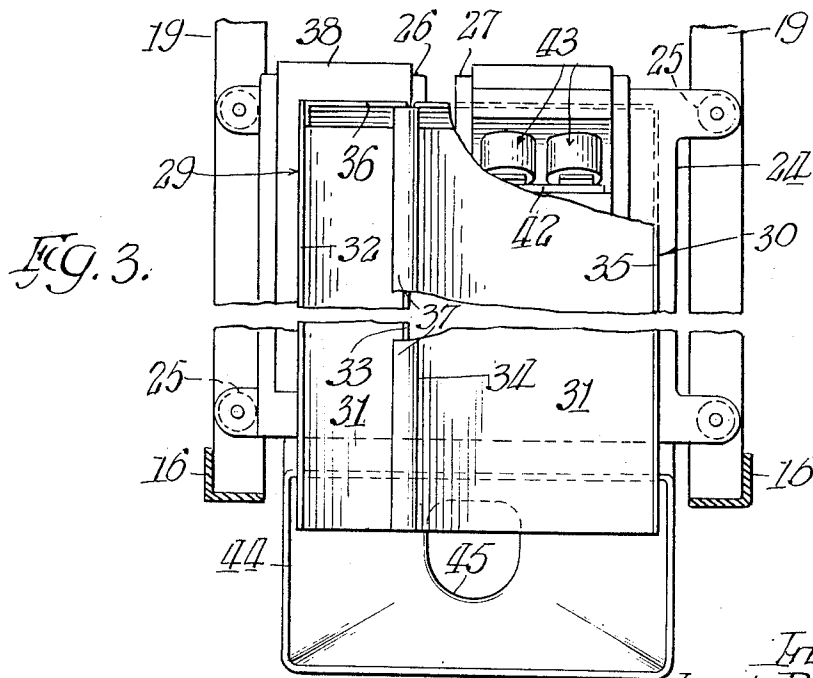
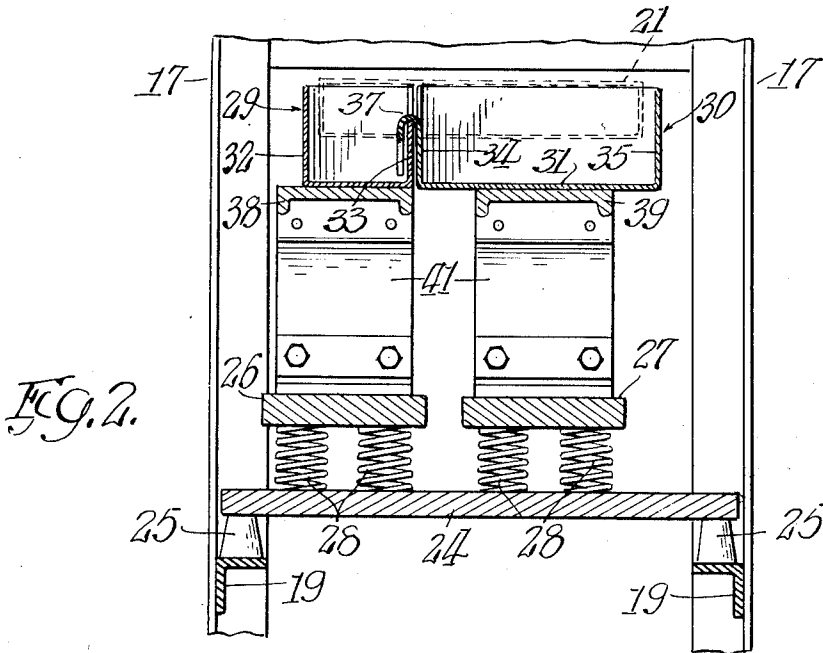
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UNITED STATES PATENT OFFICE

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VIBRATILE CONVEYER

Louis R. Muskat, Oak Park, Ill., assignor, by mesne assignments, to L. R. Muskat, Peter Muskat, Delbert Muskat, Nina L. Muskat, and Edna C. Muskat, collectively, doing business as Triangle Package Machinery Co., Chicago, Ill.

Original application November 2, 1940, Serial No. 363,972. Divided and this application December 16, 1942, Serial No. 469,170

10 Claims. (Cl. 198—220)

This invention relates to improvements in vibratile conveyers and it consists of the matters hereinafter described and more particularly pointed out in the appended claims. The present application is a divisional application as the subject matter thereof formed a part of my co-pending application Serial No. 363,972 filed Nov. 2, 1940.

The present invention is especially concerned with vibratile conveyers of the multiple tray type.

One of the primary objects of the present invention is to provide a simple, efficient and novel arrangement of the multiple trays whereby either or both of a bulk and dribble feed may be had for the material operated upon.

A further object of the invention is to provide a novel arrangement of the multiple trays so that the material to be operated upon may be delivered to one end of said trays from the single outlet of a supply hopper.

Also, it is an object of the invention to provide a multiple tray conveyor wherein the side portions of one tray are so disposed with respect to the associated side portion of the adjacent tray that the material simultaneously delivered to one end of said trays cannot pass or enter between said trays and be wasted.

Again, it is an object of the invention to provide a novel overlapping arrangement of the lateral margins of the trays.

Furthermore, it is an object of the invention to provide in a multiple tray conveyor, improved means whereby the feed from a single supply hopper is better distributed to said conveyor and in a manner which reduces clogging at this point to a minimum, if not entirely eliminating the same.

The above mentioned objects of the invention, as well as others, together with the advantages thereof will more fully appear as the specification proceeds.

In the drawings:

Fig. 1 is a vertical sectional view through one form of my improved vibratile conveyor of the multiple tray type when embodied in an automatic weighing device.

Fig. 2 is a transverse vertical sectional view through the trays appearing in Fig. 1 as taken on the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view as taken on the line 3—3 of Fig. 1.

Fig. 4 is a transverse vertical sectional view through a modified arrangement of a tray

structure which will be more fully referred to later.

The invention has especial advantages when embodied in an automatic weighing device as shown in my co-pending application before referred to. Therefore, it has been so illustrated and will be so described.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings, 15 indicates the generally open upright framework of an automatic weighing device and which framework includes pairs of upright front and rear corner posts 16 and 17. The corner posts at each side of the framework are connected together at the top by horizontal frame members 18 and said corner posts are also connected together by other horizontal frame members 19 disposed a suitable distance below the frame members 18.

A hopper 20 is supported on the frame members 18 so as to be disposed at the upper rear portion of the frame work and it is adapted to receive the bulk material to be operated upon. Said hopper has a downwardly opening spout 21 through which said material operated upon is discharged into the associated ends of a plurality of conveyer members as will soon appear. Certain adjustable gates 22 and 23 are associated with the hopper whereby the flow of material from the spout of the hopper into the before-mentioned conveyers may be controlled.

A horizontal platform 24 is supported by the frame members 19 by means of rubber blocks 25 and a plurality of conveyer supporting platforms or plates 26 and 27 are resiliently supported above said platform by means of sets of corner springs 28. Between the hopper 20 and the plates 26 and 27 there is located a plurality of generally horizontally disposed, laterally arranged trough or tray-like conveyers 29 and 30 respectively, best shown in Fig. 2.

The conveyer 30 is wider than the conveyer 29 and therefore has greater capacity because it will carry more material than the conveyer 29. These conveyers, which are here shown as disposed in closely adjacent side-by-side arrangement in a horizontal plane, extend longitudinally from the front to the rear of the framework 15. Each conveyer is open at the top and at the front end, but is closed at the rear end. Each conveyer includes a bottom 31 and inner and outer upright side walls 32—33, 34—35 and a rear wall 36 respectively. The outer side walls 32—35 of said conveyers extend into substantially the plane of the front end of the spout 21. The front end

portions of the inner walls 33—34, are of a height less than that of the outer walls.

The rear end portions of the inner walls decrease or taper in height to a point toward the rear end of the trays. This permits disposing the outlet of the spout 21 substantially within the rear end of the conveyor trays to which it simultaneously feeds material, so that the material cannot spill over the outer side walls. Therefore, said outer side walls may be kept relatively low in height. By tapering the rear end portion of said walls, choking of the spout outlet due to material piling up on said inner walls at this point, is avoided.

One tray is so formed along its inner side wall as to overlap the like side wall of the other tray so that the material fed to said trays cannot enter the space between them. In this instance the inner side wall 34 of the tray 30 is formed with a bent over flange 37 that overhangs or overlaps the inner wall 33 of the other tray 20 so as to close off the space between them, as best appears in Fig. 2.

The outlet mouth of the hopper spout is wide enough to span the rear end of both trays 20 and 30 and therefore the material from the hopper as it passes through the outlet mouth will feed simultaneously into the rear end of both trays.

The conveyor trays 20 and 30 are each mounted on a relatively rigid supporting plate 38 and 39 respectively and each of these plates is supported from the associated plate 26—27 by front and rear resilient strip-like deflectable arms 40 and 41 respectively. Said arms are inclined upwardly and rearwardly from the plates 26 and 27 and flex as will later appear so that the trays 20 and 30 carried thereby are vibrated in a substantially endwise direction. At the rear end of each supporting plate 38 and 39 is located an armature 42 only one of which appears in Fig. 1. Thus, each conveyor tray may be independently vibrated at any desired vibratory rate to govern the material feeding rate.

Coacting with each armature is an electromagnet 43 having its core disposed in operative position with respect to the associated armature. When said magnets are energized, each will attract its armature and deflect the arms 40 and 41 and impart the rearward part of the vibrator to its conveyor. This deflection is against the spring action of said arms so that they store energy therein.

When said magnets are deenergized, said stored up energy is released and the spring arms return to normal position and impart the forward part of the vibration to the conveyers.

The open front ends of both conveyers overhang and are adapted jointly or individually to discharge into the open top end of a spout 44 arranged at the front of the machine. This spout has a bottom end neck 45 over which a container 46, such as a bag, may be slipped to be filled with the material discharged into the spout from the conveyers.

In Fig. 4 I have shown three conveyers 50, 51 and 52 respectively arranged side by side, each having upright side walls 53, 54 and 55 and a bottom 56. The side walls of the intermediate conveyers 51 are formed with turned over flanges 54a—54a that overlap the side walls of the adjacent conveyers 50—52, as best shown in Fig. 3, and close off the spaces between said conveyers.

By the arrangement of the plurality of conveyers in substantially the same plane, and all discharging into the same spout, in the vibration

of the said conveyers, certain advantages flow. This arrangement permits full vision of all conveyers by the operator at the same time so that a better inspection of the material operated upon is possible. Also, a faster operation is possible because the material operated upon is not caused to pass from one conveyor to the other before said material is discharged into the spout as occurs in certain types of conveyor machines heretofore devised. Breakage of fragile material, such as potato chips, cookies, etc. is materially reduced with the arrangement of the trays described.

With conveyers arranged side-by-side, only one hopper is necessary to supply all conveyers simultaneously. With the overhang or overlapping of a part of one conveyor with respect to the adjacent one even though a single hopper feeds to said conveyers, it is impossible for material to enter between said conveyers even though one conveyor is stopped and the other continues its vibrating feeding motion.

By making the rear end of the overlapping walls with the taper, as before mentioned, the outlet of the hopper 21 can be brought into closer relation with the bottom of said conveyers and this without producing a choking of said outlet and without a spilling of the material over the outer side walls of the conveyers at said rear end thereof.

It is pointed out that by providing a wide bulk tray and a narrow dribble tray in the arrangement described, higher speeds and closer accuracy are possible in weighing operations when such an arrangement forms a part of an automatic weighing device.

The vibratile conveyers herein described may be caused to be vibrated in several combinations. For instance, when special occasion demands, both bulk and dribble feed may be had simultaneously and then this feed stopped simultaneously and thereby is obtained the same effect as that obtained by a single larger tray. Also such conveyers may be operated or vibrated so that the bulk or wider conveyor will feed material while the narrower or dribble conveyor remains inoperative and then when the bulk conveyor stops, the dribble conveyor starts and functions until the desired amount of material has been fed from the conveyers. Furthermore, both conveyers may be started simultaneously and when bulk load has been fed, the bulk conveyor stops and the final dribble feed of material is fed therefrom, after which the dribble conveyor stops. If so desired, when the bulk and dribble conveyers start operating simultaneously and the bulk conveyor is stopped, the dribble conveyor may be made to continue operating. Thus the bulk conveyor functions as an intermittent feeder and the dribble tray functions as a continuous feeder.

In describing my invention I have referred in detail to the form, arrangement and construction of the parts involved, the same is to be considered only in the illustrative sense so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. A device of the kind described embodying therein a plurality of channel shaped conveyor members arranged side-by-side and mounted for independent endwise vibrating movement in substantially the same plane, means for delivering material into one end of said conveyor members for the discharge from the other end thereof, and means bridging and closing the space between said conveyers.

2. A device of the kind described embodying therein a plurality of channel shaped conveyer members arranged side-by-side and mounted for independent endwise vibrating movement in substantially the same plane, means for delivering material into one end of said conveyer members for the discharge from the other end thereof, and means movable with one side of one conveyer and overhanging the adjacent side of the other conveyer for bridging and closing the space between said conveyers.

3. A device of the kind described embodying therein a plurality of channel shaped conveyer members arranged side-by-side and mounted for independent vibratory movement in substantially the same plane, means for delivering material into one end of both conveyers for the discharge thereof from the other end, said conveyer member having substantially upright adjacent side walls, one of said side walls carrying a bent over flange that overhangs the upright side wall of the other conveyer member to close the space between said side walls.

4. A device of the kind described embodying therein a plurality of substantially parallel, laterally spaced trough-like conveyers each having spaced side portions, and means movable with the side portion of one conveyer and overhanging a side portion of another conveyer.

5. The combination of a plurality of laterally arranged conveyer members mounted for independent endwise vibrating movement, a side portion of one of said members overlapping a side portion of the adjacent conveyer, and means for delivering material into one end of said conveyer members for discharge from the other end thereof under the action of said vibrating movement of said conveyer members.

6. The combination of a plurality of laterally arranged conveyer members mounted for independent endwise vibrating movement, each conveyer including a bottom portion and upwardly extending portions, one of the upwardly extending portions of one conveyer member overlapping an associated upwardly extending portion of the adjacent conveyer, and means for delivering material into one end of said conveyer members for discharge from the other end thereof under the action of said vibrating movement of said conveyer members.

7. The combination of a plurality of laterally

arranged conveyer members mounted for independent endwise vibrating movement, vertical interfitting portions at the associated sides of adjacent conveyer members, and means for delivering material into one end of said conveyer members for discharge from the other end thereof under the action of said vibrating movement of said conveyer members.

8. The combination of a plurality of laterally arranged conveyer members mounted for independent endwise vibrating movement, each conveyer including a bottom portion and upwardly extending side portions, one of the upwardly extending side portions of one of said members overlapping an upwardly extending side portion of the adjacent conveyer, and means for delivering material into one end of said conveyer members for discharge from the other end thereof under the action of the vibrating movement of said conveyers.

9. The combination of a plurality of laterally arranged conveyer members mounted for independent endwise vibrating movement, each conveyer including a bottom portion and upwardly extending portions, one of the upwardly extending portions of one conveyer member overlapping an associated upwardly extending portion of the adjacent conveyer, and means for delivering material into one end of said conveyer members for discharge from the other end thereof under the action of said vibrating movement of said conveyer members, the overlapping side portions of said conveyer members having an end disposed under said material delivery means and there being lower in elevation than at that end thereof associated with said other end of the conveyer members.

10. The combination of a plurality of laterally arranged conveyer members mounted for independent endwise vibrating movement, vertical interfitting portions at the associated sides of adjacent conveyer members, and means disposed above one end of said conveyer members for delivering material thereto for discharge from the other end of said conveyer members under the action of the vibrating movement thereof, said vertical interfitting portions of said conveyer members tapering in height toward the first mentioned end of said conveyer members.

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