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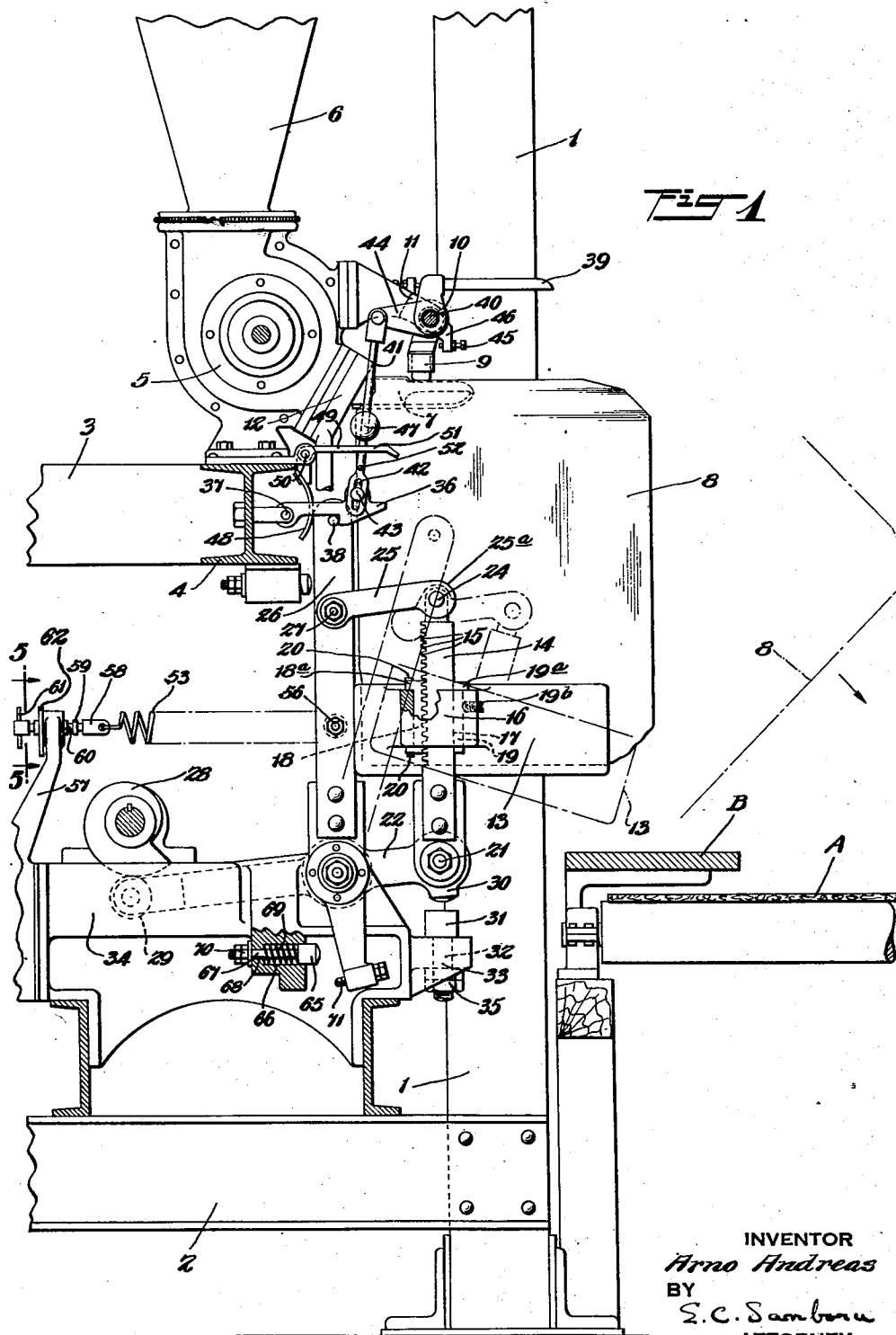
A. ANDREAS

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BAG SUPPORT FOR FILLING MACHINES

Filed Oct. 22, 1931

2 Sheets-Sheet 1



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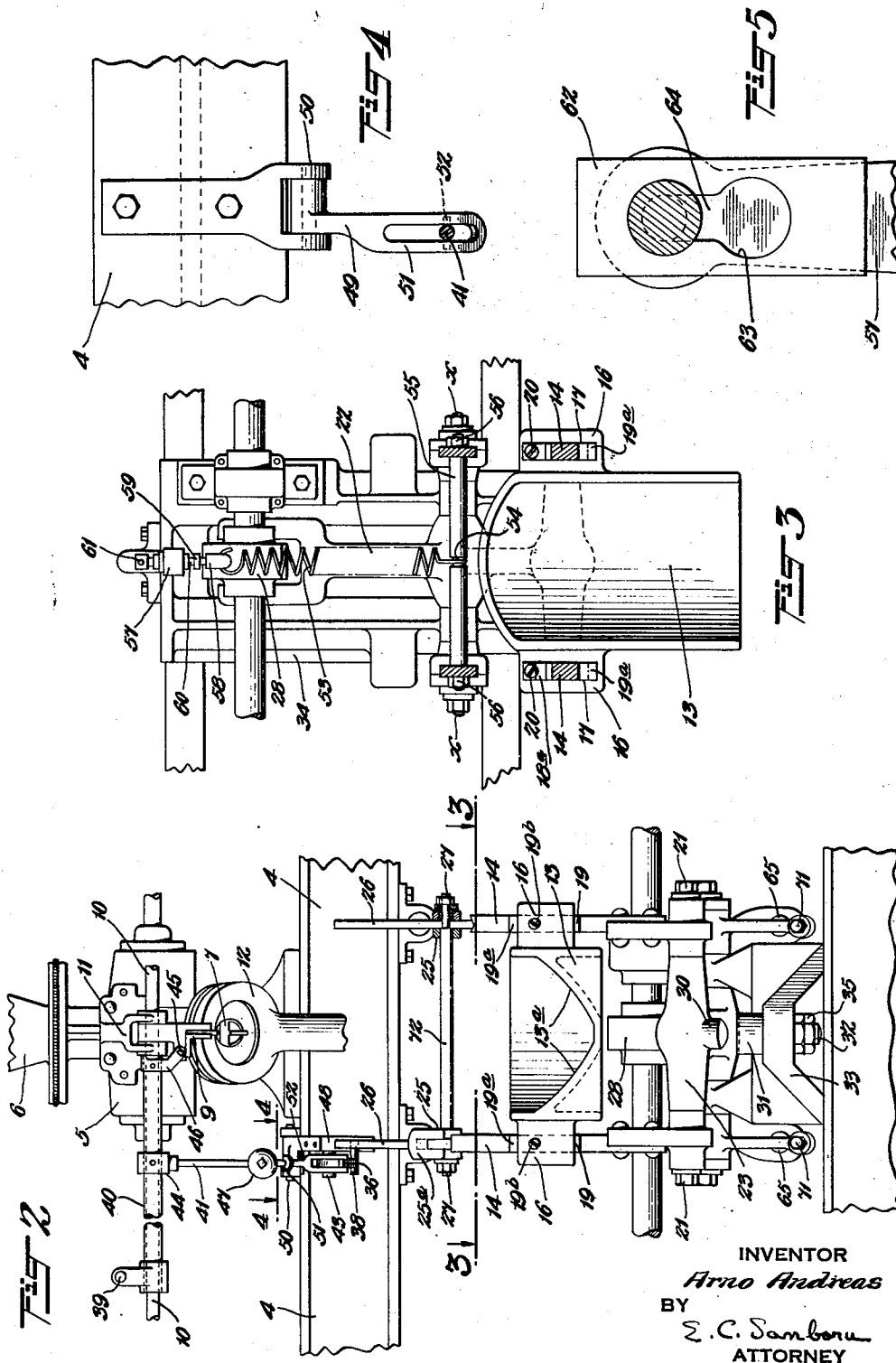
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UNITED STATES PATENT OFFICE

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BAG SUPPORT FOR FILLING MACHINES

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Application October 22, 1931, Serial No. 570,330

27 Claims. (Cl. 226—48)

This invention relates to package filling machines, particularly those adapted for filling valve bags with pulverulent material such as cement.

As in the case of most machines economy requires that bag filling machines be operated rapidly, and in order to speed the filling of material into the bags or other containers a turbine is commonly rotated at high speeds to propel the material through a spout into the containers while they are being jogged. One result, where cement or the like is being operated upon, is that a very fine dust escapes at various points, settling in the joints between relatively movable parts of the machine. The consequences of this are particularly annoying in the case of cement because the cement cakes or hardens under the action of moisture, preventing the parts from functioning properly, or sometimes, at all. One of the sections of such machines most affected by the dust is the bag support and cooperating mechanism, because they are located near the bottom of the machine and generally underneath the spout, and are thus particularly accessible to the settling dust. Of course, dust is liable to escape from practically any type of bag-filling machine, and is always objectionable, so there is not, in these remarks, any intention of excluding from the scope of the invention the use of constructions, hereafter described, in machines analogous to the type specified, such as cement packers already in use. However, as the invention was developed in connection with the machine shown in my copending application, Serial No. 419,986, it will be described in connection with a machine of this type, one of the principal objects being to provide a bag support or cradle and cooperating parts which are of simple construction, inexpensive to manufacture, and affected to a minimum by cement dust, so as to be operable at all times and easily adjustable.

The bag cradles shown in this and my copending application referred to are pivoted for tilting to discharge the bags into which material has been fed, and provision has been made for jiggling the bags. Now, it is highly desirable that the bag chair be jiggled against a solid stop, during the filling operation, so that the usual amount of material can be packed in a smaller bag, thus effecting a saving in paper or other material of which the bag is composed, but this has not proved entirely satisfactory in prior constructions. For one reason, it is not convenient to stop the jiggling during discharge of the bag and when the cradle tilts at such times, either the cradle itself or the means for limiting its tilting action may be dam-

aged. Another object of the invention is, hence, to provide an improved construction for these purposes.

Other objects and advantages of the present invention will appear as the description of a preferred embodiment proceeds with reference to the accompanying drawings wherein: Fig. 1 is a side elevation of a bag filling unit in accordance with the invention; Fig. 2 is a front elevation, partly broken away, of the construction shown in Fig. 1; Fig. 3 is a section taken on the line 3—3 of Fig. 2 looking in the direction of the arrows; Figs. 4 and 5 are detail views taken on the lines 4—4 of Fig. 2 and 5—5 of Fig. 1, respectively, looking in the direction of the arrows.

Though only one bag filling unit is illustrated, it is preferred to mount several of these on a stationary frame, which is shown as conveniently including a vertical member 1, transverse members 2 and 3, and I-beam 4. Secured to this I-beam is a turbine 5 for propelling material from hopper 6 through spout 7 into valve bag 8. For maintaining the valve opening in the bag over the spout during the filling operation a bag clamp 9 is pivoted on rod 10, the latter being supported by bifurcated arm 11. An annular dust-collecting hood 12 surrounds the end of the spout adjacent the propeller housing for receiving dust which escapes with air from the bag.

For supporting the bottom of the bag during filling, a bag chair 13, having a generally V-shaped seat 13a, is mounted on a pair of uprights 14. Now, it is desirable that the height of this chair be adjustable quickly and easily to accommodate different sizes of bags, and that the means for effecting the adjustment be not affected by cement dust. For this purpose, teeth 15 are formed on the rear of each upright, and the bag chair is provided with ears 16 having slots 17 therein surrounding the uprights. Toothed elements 18 reside in these slots and are secured to the ears by means of their extensions 18a and screws 20, their teeth being normally held in engagement with the teeth on the uprights by means of pins 19 which fit snugly between the other sides of the uprights and the ears and have enlarged portions 19a for engaging the tops of the ears. These pins preferably extend below the ears, so that they may be tapped out when desired, in order to permit disengagement of the teeth and subsequent vertical adjustment of the chair. Set screws 19b are preferably provided.

In order to obtain the most effective jogging of the bag chair with minimum undesirable at-

tendant results, the lower ends of uprights 14 are pivoted at 21 on lateral extensions 23 on the forward end of jogging arm 22. The upper ends of these uprights are journaled on pins 24 received in the forward ends 25a of the links 25, which ends are formed to overlie the top, front and sides of the pivots, and constitute housings to protect the joints from dust. Links 25 are pivoted at 27 on rear uprights 26, which are normally maintained in generally vertical position, as hereafter described. Jogging arm 22 is pivoted for movement in a vertical plane on a shaft, the axis of which is denoted as $x-x$ and which is carried on frame bed plate 34. The upright members are pivoted on the same shaft at either side of the jogging arm. For actuating the jogging arm a power driven cam 28 is provided for cooperating with a roller 29 carried on the rear end of arm 22. The cam and arm are adapted gradually to raise the chair and then drop it, downward projection 30 on the forward end of the arm then abutting against stop 31 which is adjustably secured to the frame by threaded extension 32, of reduced cross-section, passing through a corresponding opening in flange 33 on the bed plate, and by nuts 35. To adjust the stop it is only necessary to insert a washer between it and the upper side of the flange.

In order to effect the discharge of bags from the machines onto conveyor A, the construction is such that the bag chair tends to tilt forward by gravity, at least when there is material in the bag, and accordingly means are necessary to prevent this action till desired. For this purpose, a latch 36 is pivoted to the frame at 37 and is adapted to engage pin 38 on one of the rear uprights. For releasing the latch, a handle 39 is secured to sleeve 40 journaled on shaft 10, and a link 41 having a slot 42 for engaging pin 43 on the latch is pivoted to arm 44 also secured to the sleeve. Upon downward movement of the handle the latch is raised, and approximately simultaneously adjustable set screw 45 on arm 46, likewise secured to the sleeve, is caused to release the bag clamp by swinging it rearwardly. A weight 47 on link 41 aids in returning the parts to normal position. In order to give the cradle which carries the bag chair a slight kick to start the tilting of the bag chair, as is desirable in machines when the parts are worn, there is advantageously provided a booster 48 which may be of resilient material, such as spring steel, for abutting against one of the rear uprights. This booster is secured to bell-crank 49 pivoted to the frame at 50 and having a bifurcated end 51 for cooperation with a pin 52 on link 41, the pin being adapted to engage the crank at the desired time in the sequence of operations, usually just after the release of the latch and bag clamp. Further to aid in discharging the bags a cross bar 72 may be secured between the rear uprights at 27, though in practice it is generally unnecessary. This cross bar will normally be out of contact with the bags and engage them only upon tilting of the cradle.

In order to limit the swinging of the bell crank and booster, to prevent them from being moved to inoperative positions, the end of the bifurcated portion 51 may be closed and bent downwardly somewhat to abut against link 41 after the desired movement.

For automatically returning the cradle to normal position a resilient member or spring 53 has one end hooked over a groove 54 in rod 55 joining the rear uprights and secured thereto by

nuts 56. The other end of the spring is carried with extension 57 on the bed plate by means of a simple construction for easily adjusting its tension. This adjusting device advantageously consists of a member 58 provided with alternate flanges 59 and annular grooves 60, and with finger grips 61. This member extends through a hole in extension 57 corresponding in size to its larger perimeter and a key 62, including an opening with a lower portion 63 for sliding over the flanges and an upper portion 64 for abutting against a flange, is provided for engagement with one of the flanges and the side of the extension 57 opposite the spring. When the key is raised from its position in Fig. 5, adjustment is readily accomplished.

As it is desirable to limit the tilting of the cradle, especially since the jiggling preferably goes on independently of the tilting, the rear uprights 26 are extended below their pivots and abut against resilient stops of special construction. These stops have heads 65, slidable in wells 66 formed in or secured to the frame, and spindles 67 of reduced size extending rearwardly and slidably carried within openings 68 rearward of the wells. A spring 69 surrounds the spindle and seats against the head and bottom of the well to take compression, and the head is maintained against the spring and against complete ejection from the well by nuts 70. A set screw 71 may be provided on each upright for abutting against the frame to stop the tilting with a jerk after a certain amount of cushioning. Similar resilient stops are preferably provided at the upper ends of the members 26 to cushion the return of the cradle. These stops have the particular advantage that they are substantially unaffected by dust.

The operation of the machine will be understood from the above description and it is only necessary to add that a convenient platform B is provided, from where the operator can put the bags in place and control the handle 39. Suitable means for intermittently feeding desired amounts of material to the hopper are located above the hopper, but not shown, as they, together with certain features shown but not claimed, are described and claimed in my co-pending applications.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a machine for filling packages with pulverulent material, such as cement, embodying means for feeding material into the top of a package and means for supporting the bottom of the package generally below the feeding means, said supporting means including a normally upright jiggable member and a package chair, means for adjustably mounting the chair on the upright including teeth formed on the upright, an ear on the chair carrying a tooth for engagement with said teeth on the upright, and disengageable means for normally maintaining said teeth in engagement.

2. In a machine for filling packages with pulverulent material, such as cement, embodying means for feeding material into the top of a package and means for supporting the bottom of

the package generally below the feeding means, said supporting means including a normally upright member and a package chair, means for adjustably mounting the chair on the upright including teeth formed on the upright, an ear on the chair having a slot surrounding the upright, a tooth on the interior of the slot for engagement with the teeth on the upright, and a removable pin between the ear and the upright and having a portion engaging the top of the ear.

3. In a machine for filling packages with pulverulent material, such as cement, embodying means for feeding material into the top of a package and means for supporting the bottom of the package generally below the feeding means, said supporting means including a normally upright member and a package chair, means for adjustably mounting the chair on the upright including teeth formed on the upright, an ear on the chair having a slot surrounding the upright, a tooth on the interior of the slot for engagement with the teeth on the upright, and a removable pin between the ear and the upright, extending below the ear and having a portion engaging the top of the ear.

4. In a machine for filling packages with pulverulent material, such as cement, embodying means for feeding material into the top of a package and means for supporting the bottom of the package generally below the feeding means, said supporting means including a package chair and at either side thereof a normally upright jigable member, means for adjustably mounting the chair on the uprights including teeth carried thereon, ears on the chair having a tooth for engagement with the first-named teeth, and disengageable means for normally maintaining said teeth in engagement.

5. In a machine for filling packages with pulverulent material, such as cement, embodying means for feeding material into the top of a package and means for supporting the bottom of the package generally below the feeding means, said supporting means including a package chair and at either side thereof a normally upright member, means for adjustably mounting the chair on the uprights including teeth carried thereon, ears on the chair having slots surrounding the uprights, respectively, teeth on the interior of each slot for engagement with the teeth on the respective uprights, and removable pins between the ears and uprights having portions for engaging the tops of the ears.

6. In a machine for filling packages with pulverulent material, such as cement, a tiltable package support, resilient means connected to the support and adapted to urge the return thereof from tilted to normal position, and means for adjusting the force of said resilient means including a grooved member connected thereto, a stationary member, and a key adapted to reside in one of said grooves and seat against the stationary member for positioning the grooved member with respect thereto.

7. In a machine for filling packages with pulverulent material, such as cement, a tiltable package support, a coiled tension spring connected at one end to the support and adapted to urge the return thereof from tilted to normal position, and means for adjusting the force of said spring including a grooved member connected thereto, a stationary member, and a key adapted to reside in one of said grooves and seat against the stationary member for positioning the grooved member with respect thereto.

8. In a machine for filling packages with pulverulent material, such as cement, a tiltable package support, resilient means connected to the support and adapted to urge the return thereof from tilted to normal position, and means for adjusting the force of said resilient means including a grooved member connected thereto, a stationary member, and a key having an opening one portion of which is larger than said member to permit movement of the key therealong, and one portion of which is adapted to reside in one of said grooves and seat against the stationary member for positioning the grooved member with respect thereto.

9. In a bag filling machine, a rigid frame, a generally upright member pivoted thereon, resilient stops for the upper and lower ends of said upright carried on the frame, a jiggling arm pivoted to the frame at the side of said upright, a solid stop for the end of the jiggling arm forward of the upright, arms generally parallel to the upright and jiggling arms and pivoted to each other and to the upper part of the upright and said end of the jiggling arm, respectively, and a bag chair secured to the latter arm.

10. In a bag filling machine, a rigid frame, uprights pivoted thereon and having portions extending below the pivots, resilient stops for said portions carried by the frame, a jiggling arm pivoted on the frame and having a portion extending forward of said arms, a bag support, means to pivot the same on said portion of the jiggling arm, a solid stop for the bottom of said portion, and connections between the bag support and the uprights, whereby tilting of the uprights causes tilting of the chair.

11. In a bag filling machine, a rigid frame, uprights pivoted thereon, a jiggling arm pivoted on the frame and having a portion extending forward of said arms, a bag support, means to pivot the same on said portion of the jiggling arm, a solid stop for the bottom of said portion, connections between the bag support and the uprights, whereby tilting of the uprights causes tilting of the chair, and resilient means for limiting the tilting of the uprights.

12. In a machine for filling bags with pulverulent material such as cement, including a tiltable cradle for supporting the bags, resilient means for limiting the tilting of the cradle comprising a well, a stop member having a portion slidable in the well, resilient means between said portion and the bottom of the well, and means to prevent the stop from being ejected from the well.

13. In a machine for filling bags with pulverulent material such as cement, including a tiltable cradle for supporting the bags, resilient means for limiting the tilting of the cradle comprising a well, a stop member having a portion slidable in the well, and a reduced portion extending through the bottom of the well, a coiled spring between the first portion and the bottom of the well, and means to prevent the stop from being ejected from the well.

14. In a machine for filling bags with pulverulent material such as cement, including a tiltable, jigable bag support, a solid stop to limit the jiggling, and resilient means to limit the tilting.

15. In a machine for filling bags with pulverulent material such as cement, a bag cradle including uprights, a jiggling arm, arms pivoted and parallel to said uprights and jiggling arm, respectively, and a connection between the arms

including means to pivot one to the other and a cover for the top and sides thereof formed on one of the arms.

16. In a machine for filling bags with pulverulent material such as cement, a rigid frame, a generally upright member pivoted thereon, resilient stops for the upper and lower ends of said upright carried on the frame, a jiggling arm pivoted to the frame at the side of said upright, a solid stop for the end of the jiggling arm forward of the upright, arms generally parallel to the upright and jiggling arms and pivoted to each other and to the upper part of the upright and said end of the jiggling arm, respectively, covered bearings where the arms are pivoted to each other, and a bag chair secured to the latter arm.

17. In a package filling machine including tiltable package supporting means and a stationary frame member, means for jiggling said supporting means, and mechanism carried on said member for urging said supporting means to tilt.

18. In a package filling machine having a frame and a tiltable, package-supporting cradle carried therewith, means to maintain the cradle normally in upright position, means to disconnect the first-named means, and mechanism for causing the cradle to tilt carried with the frame and operable with the second means.

19. In a package filling machine including tiltable package supporting means and a stationary frame member, means for jiggling said supporting means, means carried on said member for urging said supporting means to tilt and comprising an arm adapted to abut against the supporting means and means including a handle for moving the arm.

20. In a package filling machine including tiltable package supporting means and a stationary frame member, means for jiggling said supporting means, means carried on said member for urging said supporting means to tilt and comprising an arm of resilient material adapted to abut against the supporting means and means including a handle for moving the arm.

21. In a package filling machine, jiggable package supporting means adapted to tilt by gravity to discharge a material-containing package therefrom, means for normally retaining the

supporting means against tilting, a stationary frame member, and means carried on said member for releasing the retaining means and for substantially simultaneously boosting the supporting means to cause it to tilt.

22. In a package filling machine, package supporting means adapted to tilt by gravity to discharge a material-containing package therefrom, means for normally retaining the supporting means against tilting, a stationary frame member, means carried on said member for releasing the retaining means, means carried on said member for boosting the supporting means to cause it to tilt, a handle, and interconnections between the handle, releasing means and booster means for operating both said means by a single motion of the handle.

23. In a package filling machine including tiltable package supporting means and a stationary frame member, means for jiggling said supporting means, means carried on said member for urging said supporting means to tilt and comprising an arm pivoted on the member and adapted to be swung on the pivot into abutment with the supporting means and means for swinging the arm.

24. In a bag filling machine, bag supporting means including normally upright tiltable members, certain of said members being jiggable; a stationary frame, and means on said frame co-acting with one of said upright members to urge said bag supporting means to tilt.

25. In a bag filling machine, bag supporting means including pairs of upright, tiltable members, one member of each pair being jiggable; a stationary frame; and means on said frame co-acting with the other member of a pair to urge said bag supporting means to tilt.

26. In a bag filling machine, a bag support, a stationary frame member, means to jig said support and means provided on said frame member to tilt said support.

27. In a bag filling machine, a stationary frame member; a bag support; means to jig said support; and means to tilt said support including a member, mounted on said frame, for initiating said tilting.

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