M. PARIDON & J. H. WEAVER.

MACHINE FOR BOXING MATCHES.

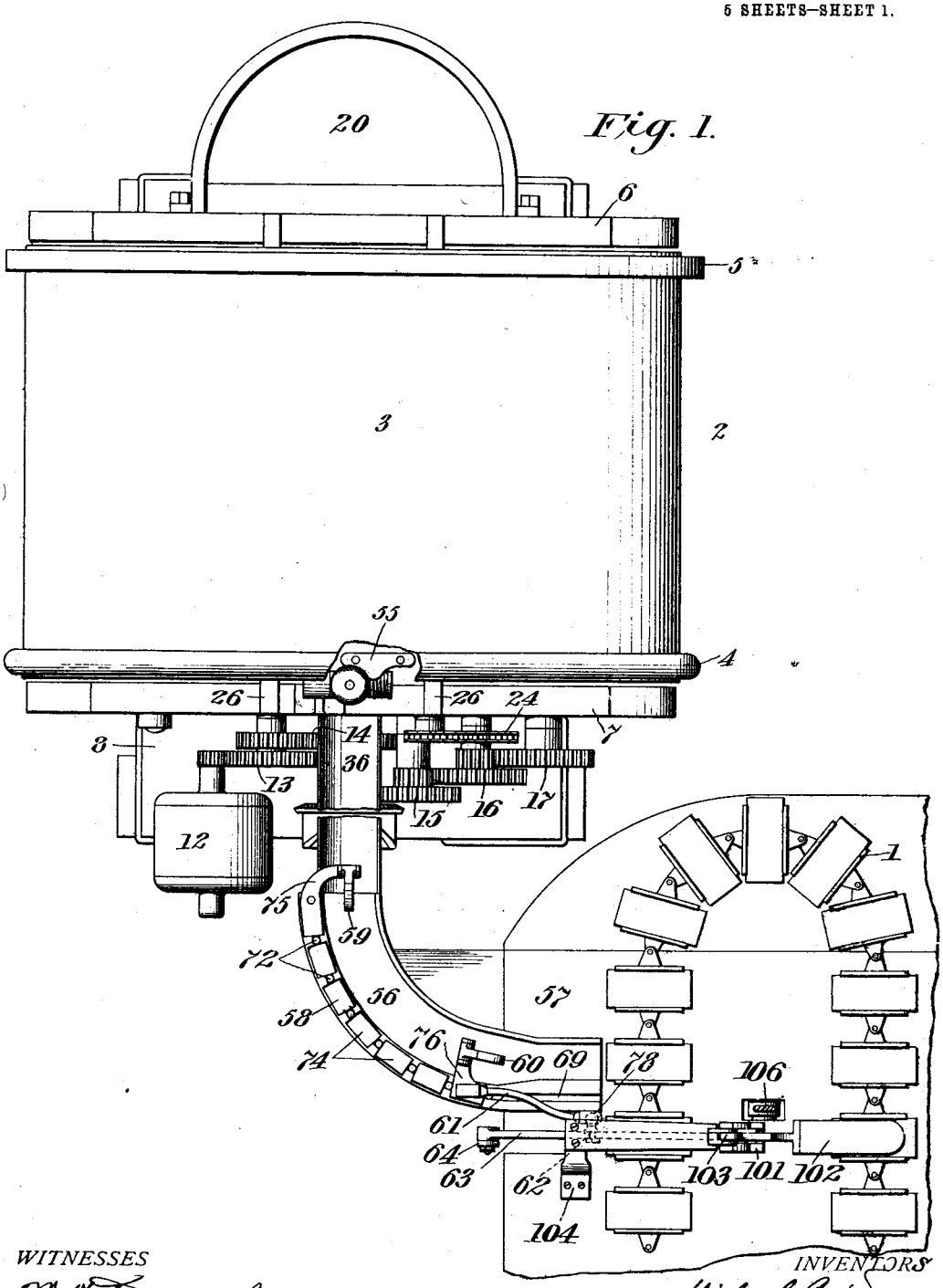
APPLICATION FILED APR. 4, 1913.

1,086,210.

Patented Feb. 3, 1914.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

W. W. Finnell Jr.

Lillie M. Perry.

INVENTORS

Michael Paridon

James H Weaver

by Wm. Finnell

Attorney

M. PARIDON & J. H. WEAVER.

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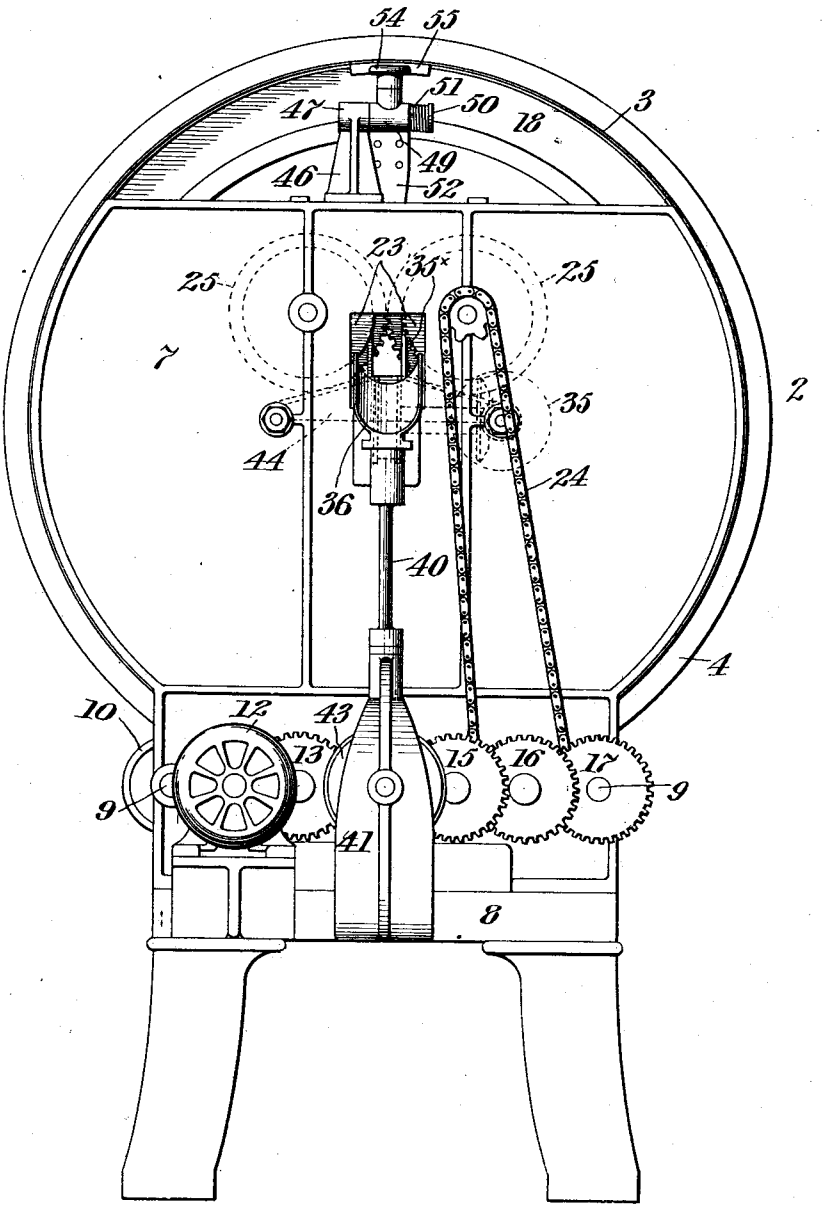
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5 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

W. W. Finckel Jr.

Lillie M. Perry.

INVENTORS

Michael Paridon

James H. Weaver

by Wm. H. Finckel

Attorney

M. PARIDON & J. H. WEAVER.

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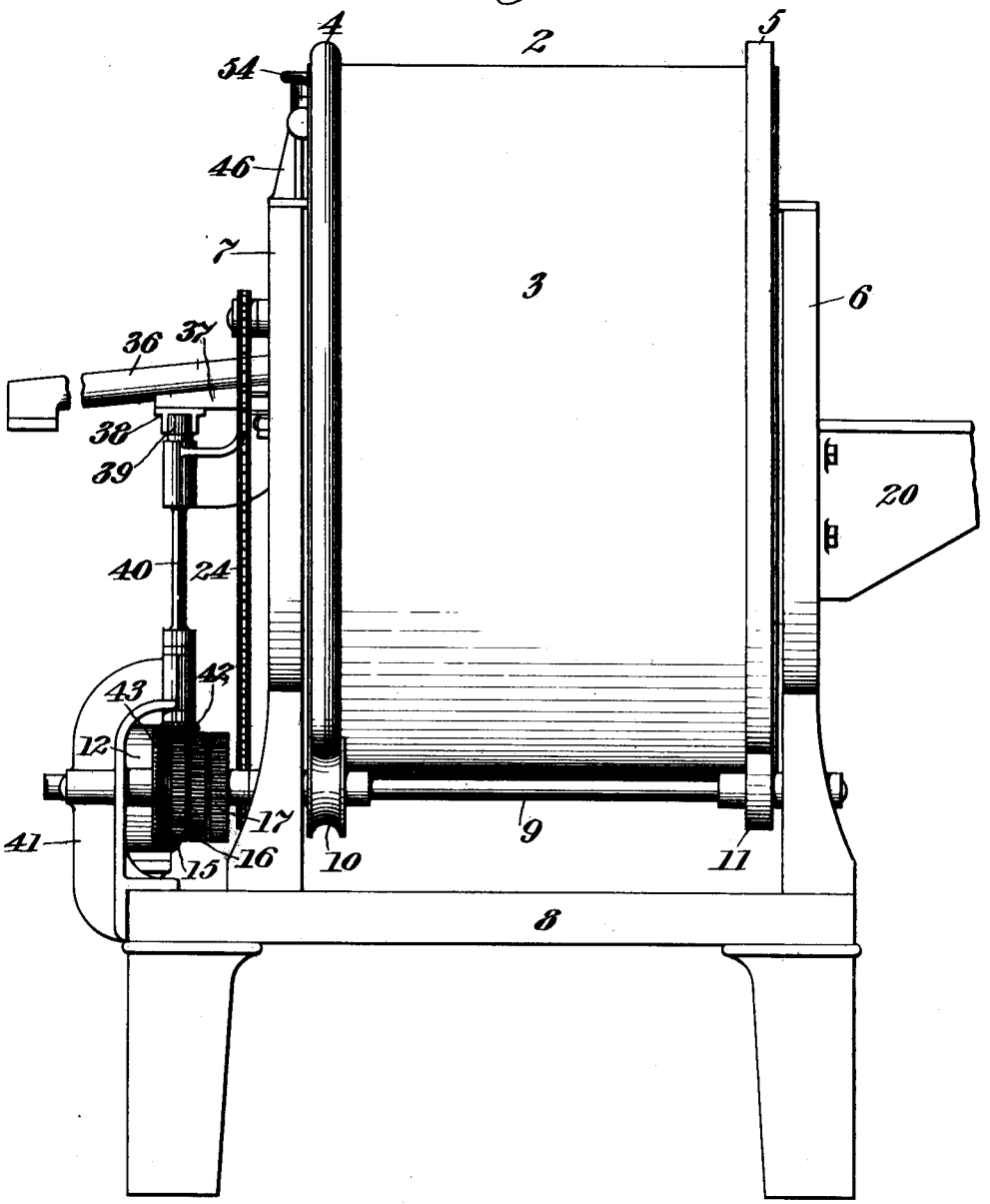
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5 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

W. M. Finckel Jr.

Lillie M. Perry

INVENTORS

Michael Paridon

James H. Weaver

by Wm. M. Finckel

Attorney

M. PARIDON & J. H. WEAVER.

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5 SHEETS—SHEET 4.

Fig. 4.

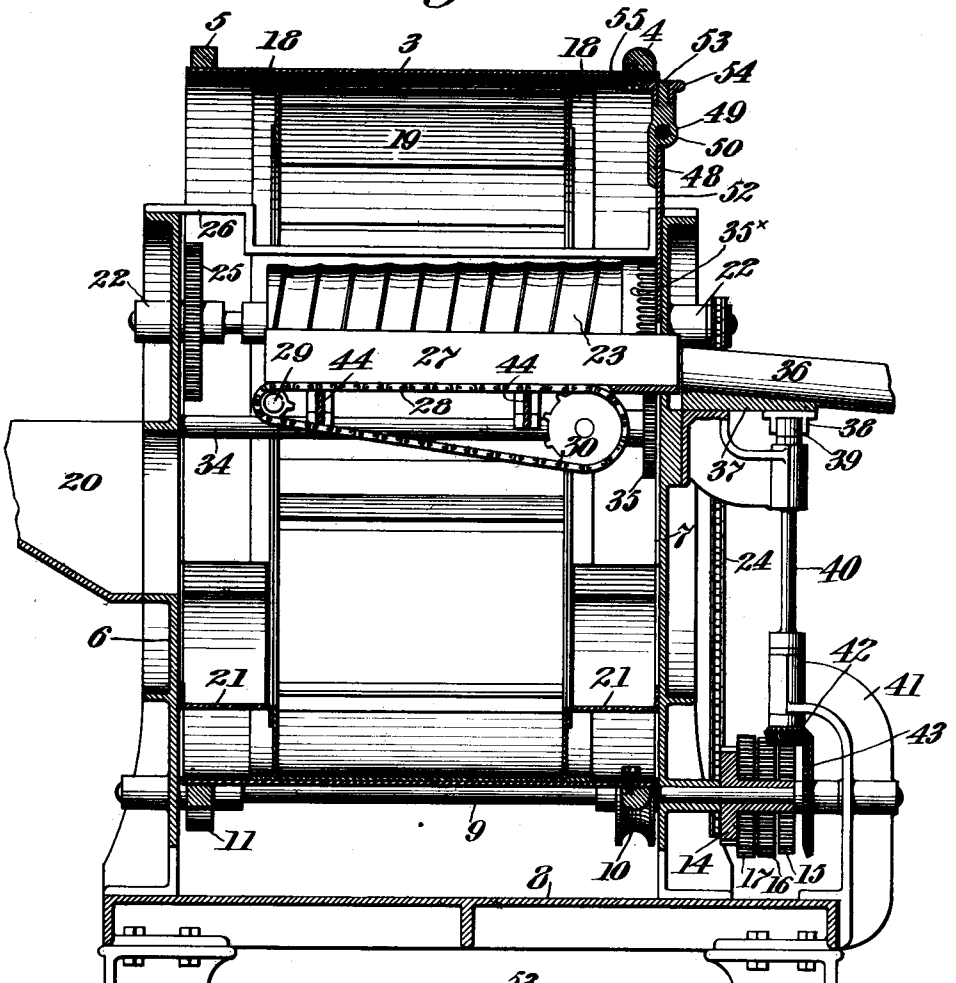
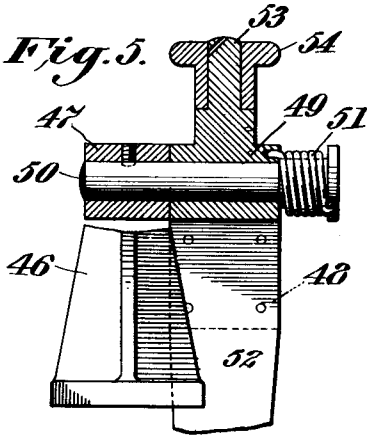


Fig. 5.



WITNESSES

W. W. Tincel Jr.

Lillie M. Petry.

INVENTORS

Michael Paridon

James H. Weaver

by Wm. W. Tincel Attorney

M. PARIDON & J. H. WEAVER.

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5 SHEETS—SHEET 5.

Fig. 6.

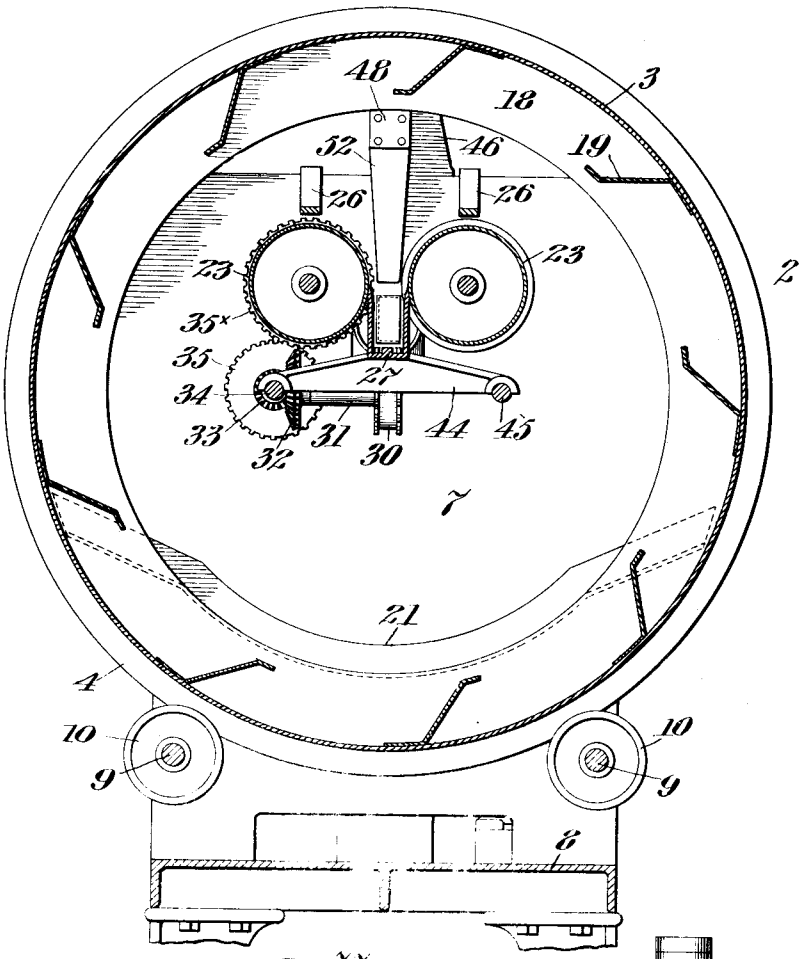


Fig. 8.

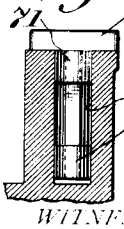


Fig. 7.

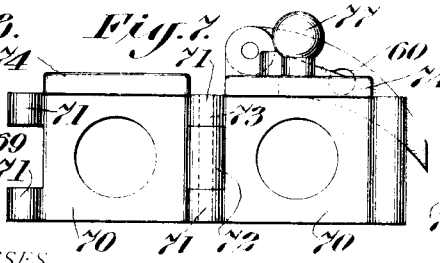
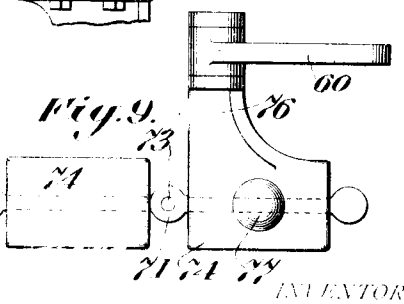


Fig. 9.



WITNESSES

W. H. Turner Jr.

Lillie M. Berry.

INVENTORS

Michael Paridon

James H. Weaver

by Wm. H. Turner

Attorney

UNITED STATES PATENT OFFICE.

MICHAEL PARIDON, OF BARBERTON, AND JAMES H. WEAVER, OF WADSWORTH, OHIO, ASSIGNORS TO THE OHIO MATCH COMPANY, OF WADSWORTH, OHIO, A CORPORATION OF OHIO.

MACHINE FOR BOXING MATCHES.

1,086,210. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed April 4, 1913. Serial No. 758,989.

To all whom it may concern:

Be it known that we, MICHAEL PARIDON and JAMES H. WEAVER, citizens of the United States, residing at Barberton, Summit county, Ohio, and Wadsworth, Medina county, Ohio, respectively, have invented a certain new and useful Improvement in Machines for Boxing Matches, of which the following is a full, clear, and exact description.

Continuous match machines have not only included the machine for making the splints and sticking them in the carrier plates, a machine for paraffining them, a machine for dipping them, means for drying them, and means for ejecting the finished matches from the carrier plates, but they have also including means for putting the matches in the trays and assembling the filled trays in the slides, shucks or outer portions of the boxes.

The boxing of the matches as last described has been accomplished with more or less hand work.

The object of the present invention is to reduce the hand work to a minimum, and render the match machine practically continuous and automatic from the cutting of the splints to the delivery of the filled boxes to the wrappers.

In carrying out the invention, we use a rotary hopper into which the empty trays are placed, and from and by which they are delivered to a carrier which successively presents them to the filling mechanism and carries them thence to mechanism by which the filled trays may be assembled with the shucks, this last feature being divided out by requirement of the Patent Office and embodied in a case filed July 25, 1913, Serial No. 781,219.

The invention herein shown is applied to a filling mechanism substantially such as that shown in the patent of Palmer and Paridon, No. 1,016,436, granted February 6, 1912. In that patent as here, the trays are placed in suitable holders which are connected in the form of an endless chain and which carry the trays from the point where they are inserted past points where they are filled with matches, and thence to a point where the shucks are applied.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a top plan view illustrating the tray-feeding mechanism. Fig. 2 is an elevation of the feed hopper. Fig. 3 is an elevation of the hopper taken at right angles to the elevation shown in Fig. 2. Fig. 4 is a vertical transverse section of the hopper. Fig. 5 is a sectional elevation, on a larger scale, of a clearing finger. Fig. 6 is a vertical section taken at right angles to the section shown in Fig. 4. Fig. 7 is a side elevation, on a larger scale, of a portion of the tray-feeding mechanism; Fig. 8 is an end view of one of the tray-feeding links and a cross-section of part of the trough in which the links slide, and Fig. 9 is a top plan view of the parts shown in Fig. 7.

The endless chain of tray holders 1, herein referred to as the "tray carrier", may be constructed and operated substantially as in the patent mentioned; and in order to feed the trays to this endless carrier in an expeditious and rapid manner, we make use of a rotary hopper 2, in which the trays are placed in quantity, that is to say, in mass. This hopper is composed of a drum or cylinder 3, having the externally arranged circumferential rails 4 and 5. This drum is mounted to turn between housings 6 and 7 which are supported upon a base plate 8. These housings support a pair of shafts 9 at opposite sides, on which are pulleys 10 and 11 shaped to receive the rails 4 and 5. The rail 4 and pulleys 10 may be curved to insure tractive effect in turning the drum and to keep it in alinement. Any suitable driving mechanism may be used, such as an electric motor 12 mounted on the base plate and geared to one of the shafts 9 by a train of gears 13, 14, 15, 16 and 17, Figs. 1, 2. Within the drum are arranged the guard rings 18, which may be made of angle-iron, and these guard rings are arranged parallel, and set inwardly from the outer edges of the drum, and in addition to strengthening the drum they serve to receive the ends of vanes 19 and support said vanes, and prevent their crushing the trays as the drum rotates. These vanes are spaced around the inside of the drum and symmetrically with relation to a vertical line drawn centrally through the drum, and in such way that the distances from either end of each vane to the adjacent housing of the drum are equal. One end of the drum is partly closed by the housing 6, having a chute 20 opening into

the inside of the drum and through which the trays or boxes are introduced into the drum. The other end of the drum is provided with the other housing 7. Within the drum are two fixed guards 21 which are fastened to the end housings and extend inwardly from the housings to the guard rings 18, and at about forty-five degrees on each side of the vertical center line, and in the form of segments of circles which are coincident with the top of the guard rings. From these forty-five degree points the fixed guards recede on a gradual slope to points at or near the drum, thus forming a fixed bottom for the drum outside of the vanes, to catch any loose trays.

Within bearings 22 in the housings are mounted the journals of a pair of helical rollers 23 which may be rotated in any suitable manner toward each other, as by a sprocket chain 24 connecting a sprocket wheel on the shaft of one of the rollers with a corresponding sprocket wheel on the shaft of one of the gears 13, 14, 15 or 16, and from this driven roller motion is imparted to the companion roller in any suitable manner, as by gears 25. The trays are carried up by the vanes as the drum rotates and dropped upon the rollers. These rollers may be cylindrical, but preferably are slightly tapering, as shown in Fig. 4, and are spaced apart a distance sufficient to permit the passage of a tray edgewise between them. Above each of these rollers is placed a bar 26 which reaches from housing to housing, and these bars serve to keep the trays from being carried away by the rotation of the rollers in any other way than that intended, namely, in a longitudinal direction along the faces of the rollers. By the term "helical rollers," it is to be understood that these rollers may be provided in any suitable way with helical faces, or right and left hand threads which serve to insure the feed of the trays; and because of their function, these rollers are herein referred to as "sorting rollers." As these sorting rollers turn in opposite directions, their helical faces serve to carry backward all surplus trays, and all those that become interlocked with one another, and permit a sufficient number of the trays to drop edgewise between them into the trough 27 arranged beneath them. The object in tapering these rollers is that in case any trays stand edgewise in the trough, such trays while being advanced between the rollers by the chain or chains 28 in the trough, will be gradually brought to the discharge end of the trough, where the faces of the rollers are closer together, that is to say, where their larger ends are located. The tray, when lying properly on its side in the trough, as in Fig. 6, will be moved beneath the rollers and discharged; but if it should be standing on end, it will be gripped by the rollers and lifted out of the trough and returned to the hopper and rearranged for proper discharge into the trough. In Fig. 6, a tray in proper position on its side, is shown in the trough 27, and it is obvious that if the tray were standing on end in the trough it would be nipped by the rollers and drawn up by them, as just described.

The trough 27 is located beneath the sorting rollers and extends up between them. Through its bottom runs sprocket chain 28, mounted on sprocket wheels 29 and 30, whereby the trays are carried forward to the discharge end of the trough. This chain may be driven by a shaft 31 having a bevel pinion 32 engaged by a bevel pinion 33 on a shaft 34 on which is a driving gear 35 meshing with a gear wheel 35× on the driving sorting roller 23. This trough 27 discharges into a U-shaped trough 36 mounted at an incline at the discharge end of the trough 27, and supported on a bearing plate 37 to which is attached a box 38. A rotary eccentric 39 on the vertical shaft 40 rotates in box 38 and thereby imparts to the U-shaped trough 36 a longitudinal vibratory movement. This shaft is supported in a bracket 41 rising from the base plate 8 and is driven in any suitable way, as by bevel gear 42 meshing with the bevel gear 43 on the shaft of one of the gears of the train of gearing hereinbefore referred to. The eccentric or cam 39 by imparting a shaking or vibrating motion to the downwardly inclined trough 36 insures the progression of the trays to the filling mechanism. The construction of the trough 36 of U-shape, or with a curved bottom, aids gravity in insuring the delivery of the trays open side up to the filling machine, and this feature is an important one of the present invention, since it obviates the necessity of an attendant to see that the trays are thus delivered. The trays emerge from the sorting rollers edgewise, and as the bottoms of the trays are heaviest, the trays would tend to gravitate bottoms down into the trough 36. The U shape of the trough aids gravity in this regard. The trough 27 may be mounted upon the cross pieces 44, Figs. 4 and 6, and these cross pieces supported on the shaft 34 and the rod 45, which shaft and rod are supported in the housings at the end of the drum.

46 is a bracket, having a bearing 47, said bracket being fixed to a portion of the housing 7, and 48 is a plate having a bearing piece 49 adapted to be alined with the bearing 47 and connected therewith by a bolt or pin 50, with a spring 51 interposed between the head of the pin and the side of the bearing piece and having one of its ends

connected with the bearing piece and the other with the pin, as shown in Fig. 5, so as to normally tend to draw the plate 48 toward the housing. Depending from and fixed to the plate 48 is a finger 52 extending down between the helical rollers. A pin 53 extends up from the bearing piece 49 of the plate 48, and has mounted on it the roller 54, and this roller comes into contact with four, more or less, cams 55 disposed at intervals on the inside of the drum, so that as the drum rotates and the cams come opposite the rollers successively, they will tend to rock the plate 48 and its finger 52 on the pin 50 with an inward motion relatively to the drum to clear any obstructions that may reach the sorting rollers, and tend to lie too long on the smooth parts of the rollers. Primarily, this finger serves as an agitator, or means to remove a chance tray from above the larger ends of the rollers.

Arranged next to the trough 36 is a curved trough 56, extending thence to a point near one end of the table 57 on which the endless chain of tray holders 1 is mounted, with its delivery end contracted and alined with the tray holders, so as to deliver the trays to the holders succesively. In order to insure this deliv... f the trays one by one to the holders as said trays are successively brought opposite said trough, we use a reciprocating feed chain 58 mounted alongside the trough 56, and having the gravity push fingers 59 and 60 which engage the trays and feed and deliver them to the holders. The fingers 59 and 60 are alike, and are pivotally or hingedly fixed to the feed chain 58 so that they will be movable vertically and ride over the leading ends of the trays and then project inside the trays so as to insure their positive advancement toward the holders. The feed chain is actuated by a rod 61 having a pivotal connection 62 with a reciprocating push bar 63, which, in turn, is pivoted to a crank-arm 64, that is vibrated in any suitable manner, as for example, by the means explained in the divisional case hereinbefore referred to.

As shown in Figs. 1, 7, 8 and 9 the feed chain is made up of a series of links which travel in a guide groove 69 alongside the trough 56. Each link has a vertical member 70 provided at opposite ends with hinge parts 71 and 72 which fit complementary parts on adjacent vertical members of the links and are connected by hinge pintles 73, so that the chain may flex as it is moved longitudinally in the groove; and each link also has a horizontal member 74 extending laterally on both sides of the vertical member and overlying the upper edges of the walls of the groove and in sliding contact therewith so as to support the chain in said groove. The push fingers 59 and 60 are preferably supported on the end links of the feed chain, and two are preferably used so that the delivery of the trays will be insured. The horizontal member 74 of one end link has the end extension 75 reaching over toward the center of the trough 56 and to which one of the gravity fingers is pivoted. The other end link has one side 76 of its horizontal member extended transversely of the trough, and to this the other push finger 60 is pivoted. This link also carries a vertically arranged ball member 77 to which one end of the rod 61 is pivoted; and a similar but horizontally arranged ball member 78 forms part of the joint 62 which connects said rod 61 with its operating mechanism.

By the means described the trays are fed and delivered to the endless carrier mechanically, and thereby an attendent at this point is dispensed with. But the invention in this particular is not limited to the specific means shown and described, since its gist is the so-called automatic feed of the trays to the carrier. After the trays are delivered by the automatic mechanism described to the endless carrier, they are presented progressively to mechanism for filling them with matches, and, if desired, to mechanism for applying to the filled trays the well-known protection strips, and then these filled trays are presented to the "sliding" mechanism, that is to say, to the mechanism for applying the shucks to the trays, one form of which forms the subject of the divisional case hereinbefore referred to.

As already sufficiently indicated, we do not limit our invention to structural details excepting as these are specifically claimed, but our invention consists rather in the principles of structure whereby the trays are fed to the filling machine and when filled are ready to be supplied with their appropriate shucks.

What we claim is:—

1. A tray supply for a match machine, comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented.

2. In a match machine, a tray carrier forming part of a filling mechanism, combined with a tray feeder including a rotary drum into which the trays are placed in mass, vanes arranged transversely within the drum, and a pair of helically formed sorting rollers supported within the drum and receiving the trays as they are carried up by the vanes and dropped and discharging those properly positioned.

3. A tray supply for a match machine, comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented, combined with conveying means for the trays arranged to allow the trays to gravitate bottom side down.

4. A tray supply for a match machine, comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented, combined with a U-shaped trough into which the trays are discharged.

5. A tray supply for a match machine, comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented, combined with a U-shaped trough into which the trays are discharged, and means to agitate said trough to settle the trays therein bottom down.

6. In a match machine, a tray carrier, a tray supply comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented, combined with a trough in which the trays are allowed to gravitate bottom side down, and means to deliver the trays from said trough to the carrier one by one.

7. In a match machine, a tray carrier, a tray supply comprising means for receiving and keeping in motion a mass of trays, means for removing trays therefrom, and means limiting the operation of the tray-removing means to trays which present one long narrow side thereto and returning to the mass of trays those not so presented, combined with a trough in which the trays are allowed to gravitate bottom side down, and a reciprocating feed chain interposed between the tray carrier and the trough and having a gravity feed finger next to the trough and a similar gravity feed finger next to the carrier.

8. In a match machine, a tray carrier forming part of a filling mechanism, combined with a tray feeding mechanism including a rotary drum into which the trays are placed in mass, rings mounted within the drum, transversely arranged vanes within said drum and between the rings, and a pair of tapering sorting rollers arranged transversely within the drum and means arranged below the rollers to support and finally discharge the trays.

9. In a match machine, a tray carrier forming part of a filling mechanism, combined with a drum into which the trays are placed in mass, stationary housings between which the drum is mounted to rotate, vanes arranged transversely in the drum to agitate the trays, a pair of sorting rollers mounted in said housings and extending transversely within the drum, and a trough arranged below the rollers and between their adjacent surfaces and adapted to receive the trays on their sides and thus discharge them from the drum.

10. In a match machine, a tray carrier forming part of a filling mechanism, a tray feeding mechanism including a rotary drum into which the trays are placed, rings mounted within the drum circumferentially, transverse vans mounted between said rings, and a pair of sorting rollers arranged within the drum, combined with stationary housings between which the drum is mounted and in which the sorting rollers are mounted to turn, and guards fixed to the housings near their bottoms and extending into the drum close to the rings.

11. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which the drum turns, transverse vanes carried by the drum, and a pair of tapering sorting rollers having their ends of greatest diameter arranged at the discharge end of the drum, the drum being adapted to receive empty boxes in mass and carry them up by means of their vanes to a point above the rollers and drop them on the rollers, said rollers adapted to discharge only those trays which it engages sidewise, and means to receive the properly positioned trays from the rollers and eject them from the drum.

12. In a match machine, an automatic tray feeding mechanism, comprising a rotary drum in which the empty trays are placed in mass, a pair of helically formed sorting rollers arranged to rotate within the rotating drum and to receive the empty trays as they are carried up by the drum and dropped upon them, ejecting means to receive the trays from the sorting rollers, and a U-shaped downwardly inclined trough alined with the ejecting means to receive the trays therefrom, and means to agitate the trough to advance the trays toward the filling mechanism.

13. In a match machine, an automatic tray feeding mechanism, including a rotary drum in which the empty trays are placed in mass, a pair of tapering rollers arranged

within the drum transversely thereof and having right and left hand helical surfaces, means to rotate said rollers in opposite directions, housings between which the drum is mounted and on which the rollers turn, and tray-supporting and discharging means arranged below the rollers.

14. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which the drum turns, a pair of sorting rollers mounted upon the housings and extending within the drum transversely, a trough arranged below the sorting rollers, and ejecting means in said trough moving toward the outlet of the drum, the drum being supplied with empty trays in mass and carrying them upward with it and dropping them upon the sorting rollers which operate selectively and deliver the selected trays to the trough.

15. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which it is mounted, a pair of tapering rollers mounted to turn in said housings and arranged transversely within the drum, a tray discharge trough located below the rollers and intermediate thereof, and means to rotate the rollers toward each other and thereby turn the trays edgewise and pass them thus into the discharge trough.

16. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which it is mounted to turn, a pair of tapering rollers increasing in diameter toward their discharge ends and mounted within the housings transversely of the drum, a trough arranged below said rollers and extending up between them, and means in said trough to advance to the discharge end the trays delivered to it by the said rollers.

17. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which it is mounted, a pair of tapering rollers to which the empty trays are delivered by the rotary drum, tray-supporting and discharging means arranged below the rollers, and a periodically operated finger extending downward between the rollers near the discharge end and serving to dislodge obstructions between said rollers.

18. In a match machine, a tray feeding mechanism including a rotary drum, stationary housings between which it is mounted, a pair of tapering rollers to which the empty trays are delivered by the rotary drum, tray-supporting and discharging means arranged below the rollers, and a hinged finger, a roller on the finger, and a cam element on the drum arranged to act upon the roller to vibrate the finger.

In testimony whereof we have hereunto set our hands this 2nd day of April A. D. 1913.

MICHAEL PARIDON.
JAMES H. WEAVER.

Witnesses:
J. A. CRUMRIVE,
A. M. BECK.

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MICHAEL PARIDON.
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Corrections in Letters Patent No. 1,086,210.

It is hereby certified that in Letters Patent No. 1,086,210, granted February 3, 1914, upon the application of Michael Paridon, of Barberton, and James H. Weaver, of Wadsworth, Ohio, for an improvement in "Machines for Boxing Matches," errors appear in the printed specification requiring correction as follows: Page 1, line 18, for the word "including" read *included*; same page, line 34, for the word "sucecssively" read *successively*; page 3, line 28, for the word "succesively" read *successively*; page 4, line 88, for the word "vans" read *vanes*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of February, A. D., 1914.

[SEAL.]

J. T. NEWTON,
Acting Commissioner of Patents.

Corrections in Letters Patent No. 1,086,210.

It is hereby certified that in Letters Patent No. 1,086,210, granted February 3, 1914, upon the application of Michael Paridon, of Barberton, and James H. Weaver, of Wadsworth, Ohio, for an improvement in "Machines for Boxing Matches," errors appear in the printed specification requiring correction as follows: Page 1, line 18, for the word "including" read *included*; same page, line 34, for the word "succcssively" read *successively*; page 3, line 28, for the word "succesively" read *successively*; page 4, line 88, for the word "vans" read *vanes*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

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