Feb. 15, 1938. C. F. WRIGHT 2,108,280

MACHINE FOR PACKING BOOK MATCHES

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Fig. 1.

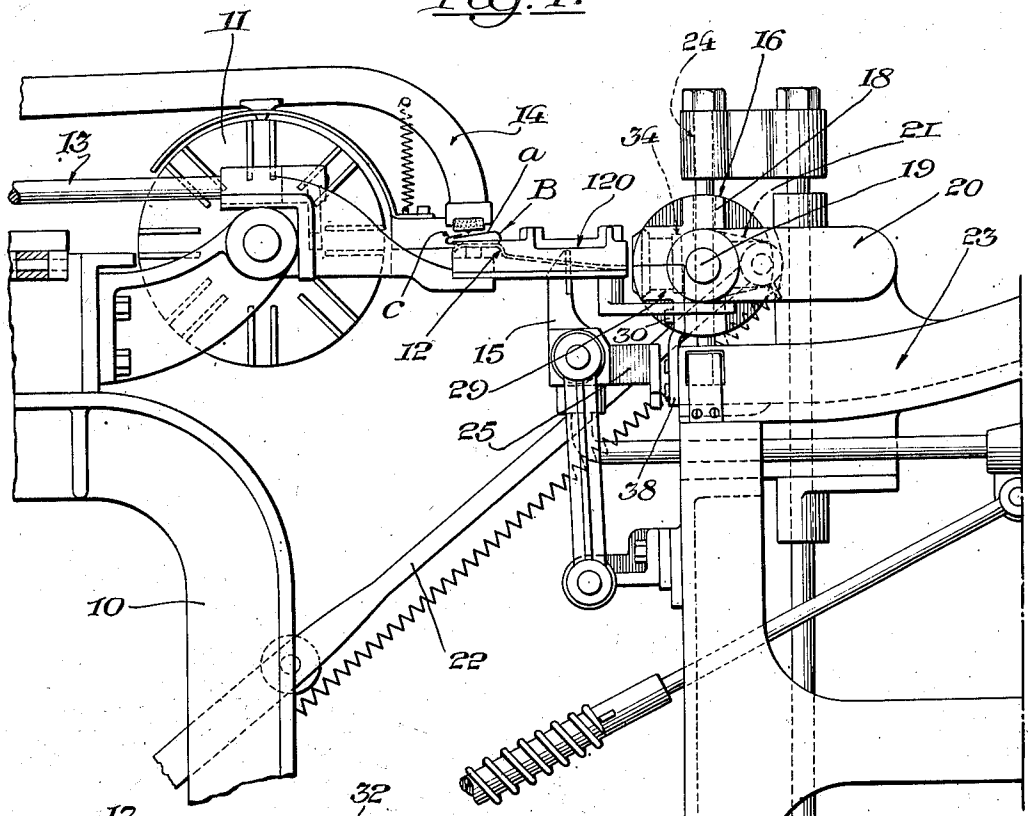

Fig. 2.

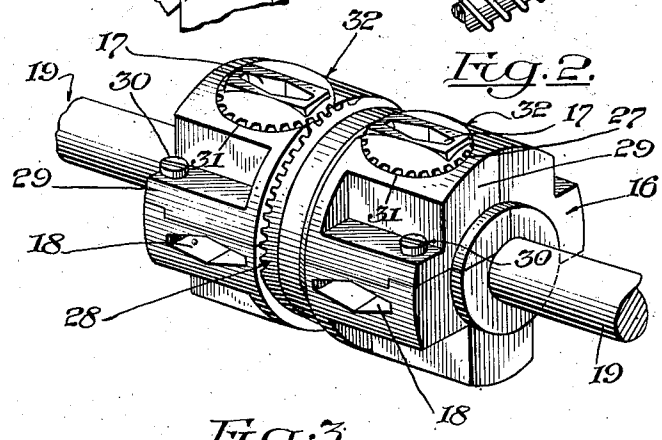

Fig. 4.

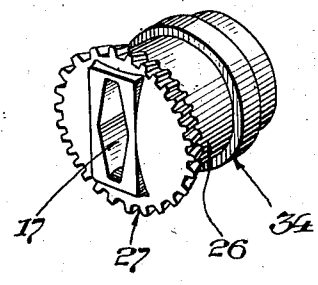

Fig. 3.

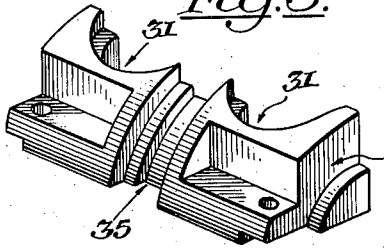

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Fig. 5.

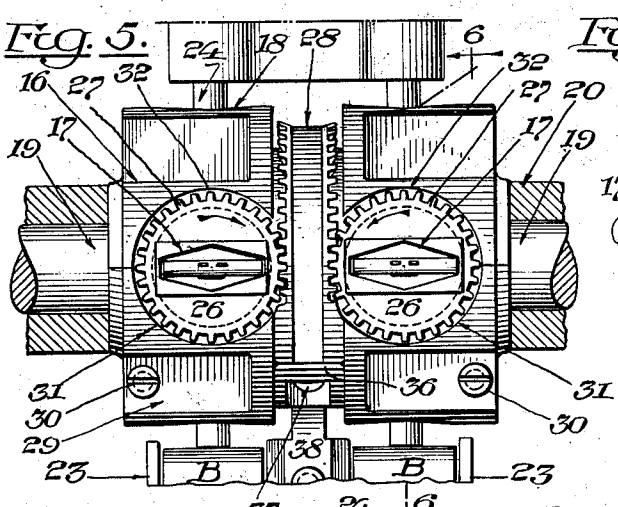


Fig. 6.

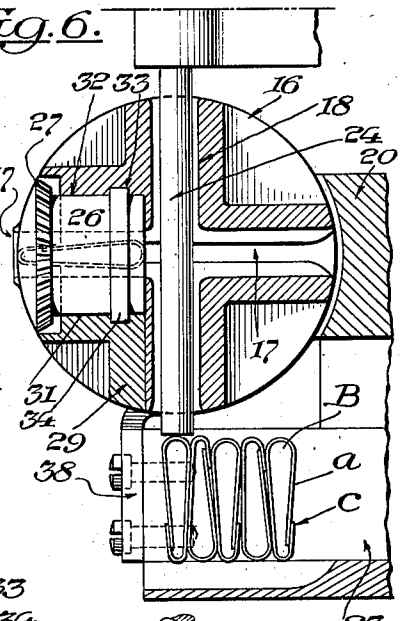


Fig. 7.

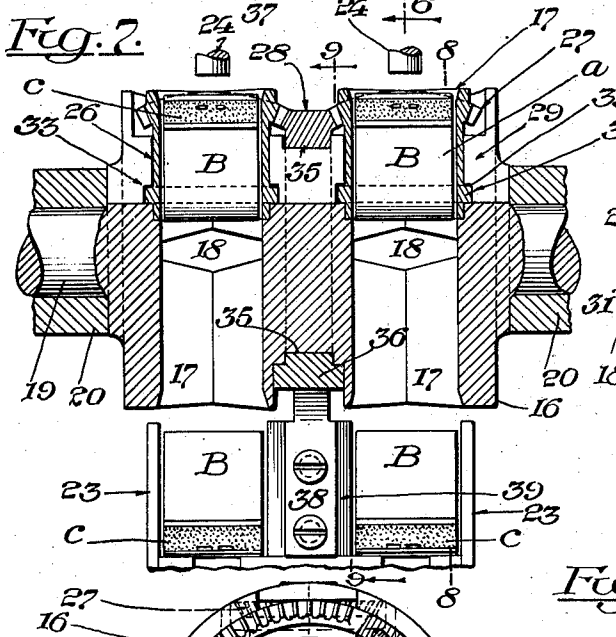


Fig. 8.

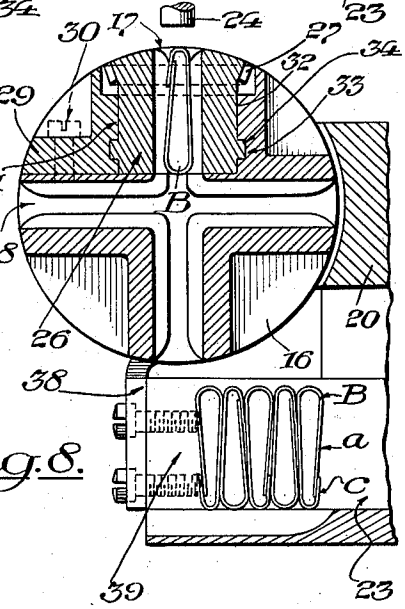
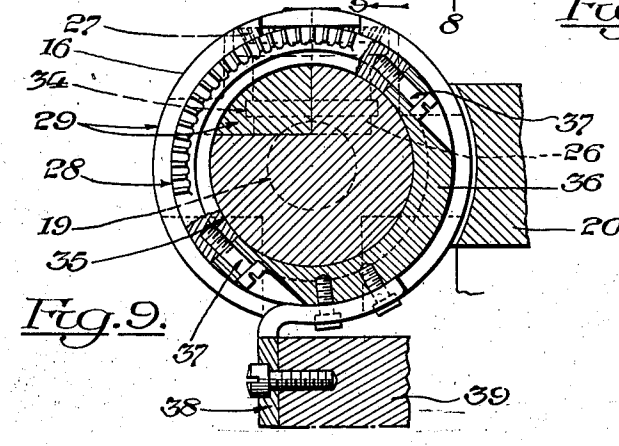


Fig. 9.



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UNITED STATES PATENT OFFICE

2,108,280

MACHINE FOR PACKING BOOK MATCHES

Charles F. Wright, Akron, Ohio, assignor to The Diamond Match Company, New York, N. Y., a corporation of Delaware

Application May 8, 1937, Serial No. 141,384

5 Claims. (Cl. 226—4)

This invention relates to mechanism for assembling book matches of the type wherein cards or combs of matches are encased in a flexible cover having a front flap which when closed is adapted to be tucked under the free edge of the short front fold at the base of the match cards or combs.

The invention has especial reference to match book assembling mechanism embodying a book receiving and reversing element from which the books are successively delivered vertically to a packing trough in close lateral relation and endwise reversed in alternation, as illustrated for example in Patent No. 1,217,991, dated March 6, 1917.

The object of the invention is to provide simple and efficient mechanism whereby book matches are assembled in a compact row, not only with the books reversed endwise as heretofore, but also with the smooth back of each book of the row in contact with the front fold of the adjacent book, thereby obviating the liability of the interlocking of the opposing folds of adjacent books during the removal of a book from a container in which the books are row-wise arranged.

To this end my invention comprises novel features of construction and combination of parts, which in a preferred form will be hereinafter described, the scope of the invention then being expressed in the appended claims.

In the drawings—

Figure 1 is a side elevation of a portion of the delivery end of a match booking machine equipped with book reversing mechanism embodying my invention.

Fig. 2 is a perspective view of the book reversing turret, including the book reversing heads therein.

Fig. 3 is a similar view of a detachable segmental block portion of the turret.

Fig. 4 is a similar view of one of the book-reversing heads.

Fig. 5 is a front elevation of the turret and its adjuncts, showing the reversing heads in book receiving position and match books seated therein.

Fig. 6 is a vertical section through the turret and the underlying portion of the packing trough, as on the line 6—6 of Fig. 5.

Fig. 7 is a sectional elevation of the turret and adjuncts, the turret being represented as turned through a path of 90° and its reversing heads as independently moved on their axes so that the contained match books are up-ended and also facewise reversed preparatory to their delivery to the underlying packing trough.

Figs. 8 and 9 are vertical sections, as on the lines 8—8 and 9—9, respectively, of Fig. 7.

Referring to the drawings, 10 designates the delivery end of a match booking machine, including an intermittently rotatable flap folding wheel 11 from which the books are horizontally discharged in pairs in similar endwise and face arrangement upon a yielding supporting plate 12 by the action of a reciprocating ejector frame 13, the larger or headed ends of the matches leading and the fold faces of the covers being upward. 14 designates a reciprocative tucker member operative to insert the free ends of the cover flaps (*a*) of each successive pair of books (B) under the stapled short folds (*c*) of the covers at the narrow ends of the respective books. Each pair of closed books are pushed onward by the next succeeding pair of books presented to the tucker, the leading books being thereby moved to and upon a bed 120 along which they are further advanced flatwise by a vibratory pusher member 15 and thereby entered in the aligning radial chambers of an oscillatory book reversing member 16. This member 16 comprises a cylindrical body or turret having two pairs of intersecting passages or chambers 17 and 18, respectively, extending diametrically therethrough at right angles to each other. The turret has axial studs 19 journaled in a suitable bracket structure 20 located adjacent the outer end of the supporting bed 120, one of which studs is equipped with a crank 21 which is connected with suitable actuating means including a connecting rod 22 effective to oscillate the turret and position the respective pairs of passages 17 and 18 for the reception of books successively advanced by the pusher. That is to say, in one oscillatory stroke of the turret the books introduced in one pair of passages are carried downward from horizontal to vertical position so that the narrow ends of the books point downward, and in the next stroke the books contained in the other pair of passages are carried upward from horizontal to vertical position so that the narrow ends of the latter books point up. The books thus alternately disposed in opposite endwise relation by the oscillatory turret are discharged therefrom into the directly underlying receiving end of a packing trough 23 by the action of vertically reciprocating plunger rods 24 on the opposing books. These rods are mounted in spaced parallel relation and are movable into and from the vertically positioned passages of the turret during each dwell of the latter. The books

when delivered to the trough are progressively advanced therealong in two parallel columns by means of a reciprocating head, as **25**, carried by the pusher actuating element.

The before described mechanism, excepting as hereinafter pointed out, is substantially the same in construction and operation as heretofore. In the prior mechanism the face arrangement of the books during their oscillatory travel in the turret remained unchanged, and hence when the endwise reversed books were delivered to the packing trough the smooth backs of each pair of books were in contact, and the fronts of the adjacent books of the respective pairs were also in contact as hereinbefore mentioned. Hence when the books were severally slid endwise from the row (that is, longitudinally of the match stems) as in the case where they are stacked in a vending machine, the short front fold of each book as it was being removed frequently engaged the opposing short fold of the next succeeding book of the row, thus causing the two folds to interlock and thereby prevent the removal of the individual book, or, instead, effect the removal of the two interlocked books.

According to my invention the turret structure embodies simple and efficient mechanism whereby each alternate pair of books are facewise reversed during their movement in the turret from horizontal to vertical position, thus not only reversing the alternate books endwise preparatory to their delivery to the packing trough but, coincidentally, facewise reversing the alternate books so that when the books are packed face to face in the trough the smooth back of each book of a row is in contact with the folded front of the adjacent book, thus overcoming the objection previously mentioned.

In the illustrated embodiment of my invention, the book receiving portions of one pair of passages (**17**), instead of being formed directly in the body of the turret as heretofore, are formed in radially disposed cylindrical heads **26** which are rotatably mounted in the turret, which passages when the heads are adjacent the paths of the books on the bed **120**, are in proper relative position to receive the books advanced by the pusher member **15**. The outer end of each head **26** is flush with the periphery of the turret, or substantially so, and is provided with gear teeth **27** which mesh with a suitably-disposed stationary segment gear **28** concentric with the turret. This gear is so arranged that the teeth of the head **26** remain in mesh therewith during the upward and downward strokes of the turret between the horizontal book receiving and vertical discharging positions; the ratio of the gearing being such that the head is independently rotated on its axis a half turn during the upper stroke, (thus facewise reversing the match book during its upward travel to the path of the ejecting plunger) and then, upon the ejection of the book, returning the head to its previous position during the travel of the head to the book receiving level.

In the present instance the periphery of the turret body is longitudinally recessed to receive a removable segmental block **29** which when secured in place, as by screws **30**, constitutes a unitary part of the turret. A section **31** of each socket for the reception of a head **26** is formed in the inner radial wall of the block **29** and the complementary section **32** of such socket is formed in the turret body as shown, it being noted that the walls of the socket sections are correspondingly grooved, as at **33**, to provide when the parts are assembled an annular groove which freely receives an annular flange **34** on the interposed head. This construction affords a simple and efficient mounting for the heads and enables the ready assembling or disassembling of the parts as desired.

The turret, including the removable block **29**, has formed therein intermediate the two heads **26** a peripheral groove **35** in which the segment gear **28** is mounted, which gear is provided with oppositely disposed gear faces with which mesh the teeth of the respective heads. The segment gear **28** is supported by means of a lower segmental member **36** which is seated in the groove **35** and is secured to the respective ends of the segment gear by means of screws **37**, the member **36** being in turn fixedly supported by a bracket **38** rising from the median partition **39** of the packer trough **23**. Thus the segment gear **28** and the segmental member **36** constitute a stationary annulus within which the turret is mounted for oscillation.

It is to be understood that the invention is not limited to the particular exemplifying form thereof herein disclosed, as the mechanism may be modified within the principle of the invention and the scope of the appended claims.

I claim—

1. In a machine for packing match books each including a cover having a flat back and a folded front portion, the combination with means for feeding the books end to end with the heads of their respective matches pointing in the same direction, of positioning means including a turret for receiving the said books and reversing the endwise position of alternate books as to the match heads and coincidentally facewise reversing the alternate books carried by the turret, and means for ejecting said books successively from the turret, whereby each alternate book is disposed with its flat back in contact with the folded front of the next adjacent book.

2. In a machine for packing match books each including a cover having a flat back and a folded front portion, the combination with means for feeding the books end to end with the heads of their respective matches pointing in the same direction, of means for receiving the said books in succession and reversing the endwise position of alternate books as to the match heads and coincidentally facewise reversing the alternate books, said book receiving and reversing means including an oscillatory turret body having therein a head mounted for independent oscillation on an axis radially of said body and adapted to receive the alternate books, means for actuating said body, means for independently actuating said head during the motion of the turret body, and means for ejecting the books successively from the turret.

3. In a machine for packing match books each including a cover having a flat back and a folded front portion, the combination with means for feeding the books end to end with the heads of their respective matches pointing in the same direction, of means for receiving the said books in succession and reversing the endwise position of alternate books as to the match heads and coincidentally facewise reversing the alternate books, said book receiving and reversing means including an oscillatory sectional turret body, a head mounted between the sections of said body for independent oscillation about an axis radially of said body and adapted to receive the alter-

nate books, means for actuating said body, means for independently actuating said head during the motion of the turret body, and means for ejecting the books successively from the turret.

4. In a machine for packing match books each including a cover having a flat back and a folded front portion, the combination with means for feeding the books end to end with the heads of their respective matches pointing in the same direction, of means for receiving the said books in succession and reversing the endwise position of alternate books as to the match heads and coincidentally facewise reversing the alternate books, said book receiving and reversing means including an oscillatory sectional turret body, a head mounted between the sections of said body for independent oscillation about an axis radially of said body and adapted to receive the alternate books, means for actuating said body, means for independently actuating said head during the motion of the turret body and comprising a gear portion on the head and a gear element in mesh therewith loosely encircling the turret body, and means for ejecting the books successively from the turret.

5. In a machine for packing match books each including a cover having a flat back and a folded front portion, the combination with means for feeding the books end to end with the heads of their respective matches pointing in the same direction, of an oscillatory turret having therethrough two intersecting diametric passages into which match books are delivered successively, a head mounted in said turret for oscillation on an axis radially of the turret, and having a chamber constituting a radial portion of one of said diametric passages, means for oscillating the turret to move the said head from the book receiving path to the path of discharge and coincidentally to move the intersecting diametric passage from the path of discharge to the book receiving path, and the converse, means for independently oscillating said head during the motion of the turret, and means for ejecting each succeeding book from the turret at the path of discharge.

CHARLES F. WRIGHT.