

Dec. 24, 1929.

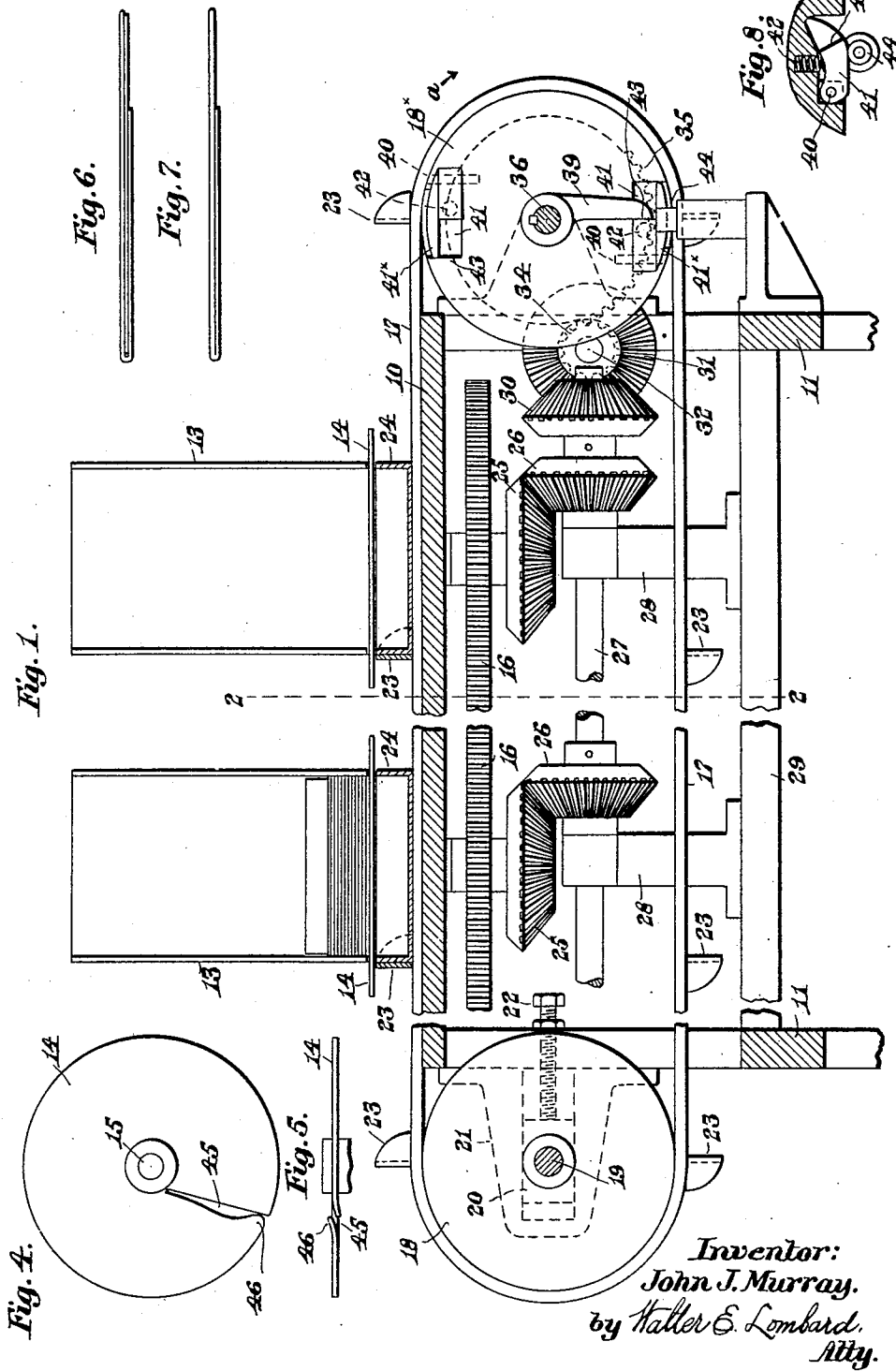
J. J. MURRAY

1,741,067

CARD SEPARATING MECHANISM

Filed June 13, 1928

2 Sheets-Sheet 1



Dec. 24, 1929.

J. J. MURRAY

1,741,067

CARD SEPARATING MECHANISM

Filed June 13, 1928

2 Sheets-Sheet 2

Fig. 2.

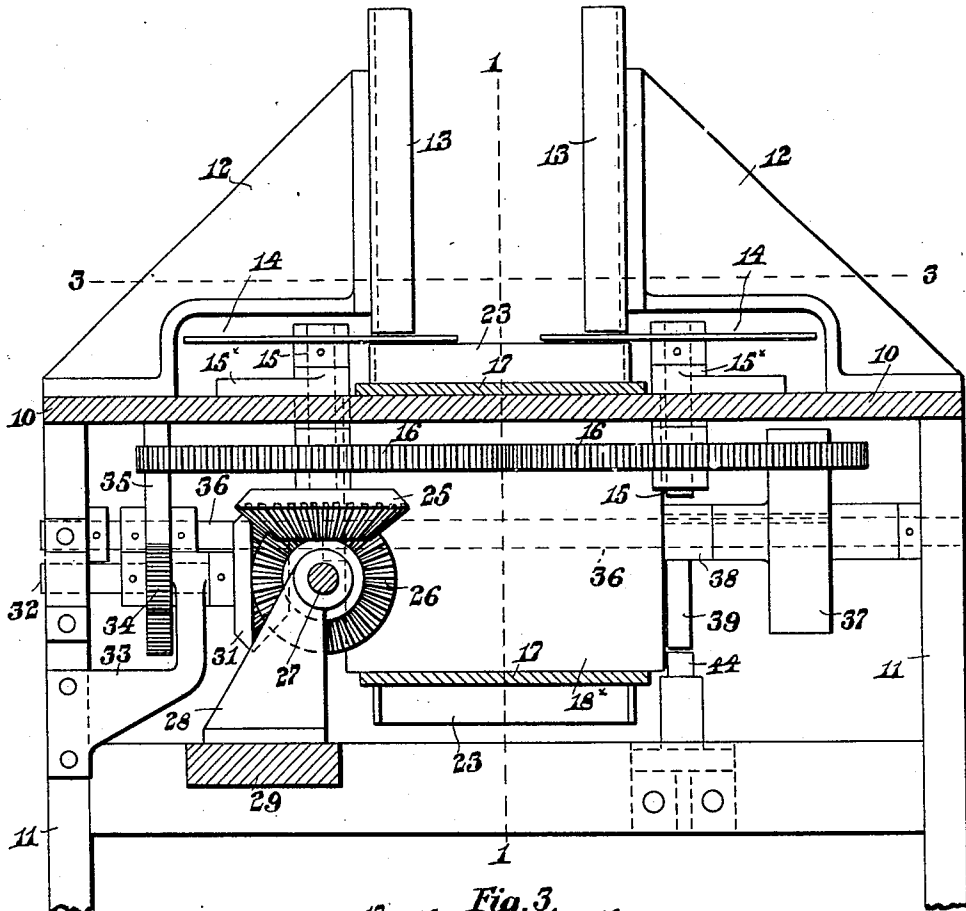
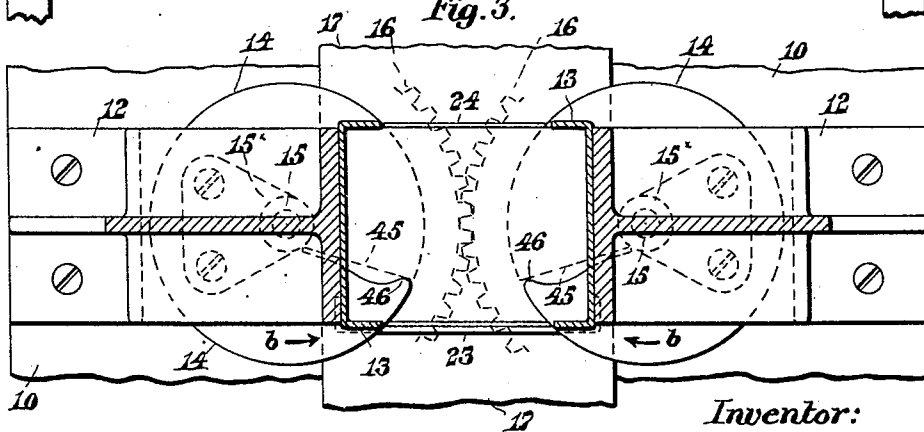


Fig. 3.



Inventor:  
John J. Murray,  
by Walter E. Lombard,  
Atty.

## UNITED STATES PATENT OFFICE

JOHN J. MURRAY, OF ARLINGTON, MASSACHUSETTS

## CARD-SEPARATING MECHANISM

Application filed June 13, 1928. Serial No. 285,101.

This invention relates to card separating mechanism and has for its object the production of a machine in which a single card may be separated from each of a plurality of packs and deposited in a box which when filled will contain a plurality of dissimilar cards.

This object is attained by the mechanism illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a vertical longitudinal section of a machine embodying the principles of the present invention.

Figure 2 represents a transverse section of same on line 2, 2, on Fig. 1.

Figure 3 represents a horizontal section of a portion of the machine, on line 3, 3, on Fig. 2.

Figure 4 represents a plan of one of the separating disks.

Figure 5 represents an elevation of said disk.

Figure 6 represents an end view of an envelope to be used in the machine and showing a card under the flap thereof.

Figure 7 represents an end view of said envelope with the card therein, and

Figure 8 represents a sectional detail of a portion of the conveyor driving mechanism.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a table supported on the framework 11.

Extending upwardly from the table 10 are a plurality of pairs of oppositely disposed brackets 12, each bracket having secured thereto a vertical U-shaped member 13, each

pair of U-shaped members 13 forming a hopper open at the top and the bottom.

The lower ends of the U-shaped members 13, 13, are a short distance above the top of the table 10.

Disposed beneath each bracket 12 is a disk 14, these disks being secured to shafts 15 revoluble in bearings 15\* secured to the top of the table 10 and extending downwardly therethrough.

The lower end of each shaft 15 has a spur gear 16 secured thereto, each pair of spur gears 16 intermeshing and rotating in opposite directions.

Between each pair of bearings 15\* is an endless conveyor 17, the upper section of which rests upon and travels over the upper face of the table 10.

This endless conveyor 17 is mounted on rollers 18, 18\*.

The roller 18 is secured to a shaft 19 revolvably mounted in a bearing 20 adjustably endwise in a bracket 21 by means of the set screw 22, thereby providing a means for keeping the conveyor belt taut at all times.

This conveyor belt 17 has on its outer face the outwardly extending U-shaped members 23 which are adapted to register a box 24 thereon so that in the movement of the conveyor 17 the boxes 24 will travel immediately beneath the hoppers 13, 13.

When in operation the conveyor belt 17 moves in the direction of the arrow *a* on Fig. 1 of the drawings, each box-registering device 23 thereon pushing a box 24 ahead of it.

The hoppers formed by the U-shaped members 13 are all in alinement lengthwise of said conveyor belt 17.

In practice a considerable number of these hoppers are used but in order to simplify the drawings only two such hoppers 13, 13 are shown as indicated in Fig. 1, the central portion of the machine being omitted.

The distance between the box-registering devices 23 and the hoppers 13, 13, is such that when the conveyor belt 17 is at a standstill a box 24 will be disposed immediately beneath the open bottom of each hopper 13, 13.

In each hopper 13, 13, is disposed a stack of cards or similar articles having a weight

thereon to press them downwardly onto the portions of the disks 14 extending beneath the bottom of said hoppers and immediately above the top of the boxes 24.

5 The lower ends of each of the vertical shafts 15 on one side of the conveyor 17 has secured thereto a bevel gear 25 meshing with a bevel gear 26 on a shaft 27 mounted in bearings 28 extending upwardly from a bar 10 29 forming part of the framework 11.

One end of the shaft 27 has secured thereto a bevel gear 30 meshing with a bevel gear 31 on a shaft 32 rotatable in a bracket 33 secured to the framework 11.

15 The shaft 32 has secured thereto a spur pinion 34, the teeth of which mesh with the teeth of an interrupted gear 35 secured to one end of and revoluble with a shaft 36 extending transversely of the framework 11.

20 The opposite end of said shaft 36 has a driving pulley 37 keyed thereto.

Said shaft 36 also has keyed thereto the collar 38 of an arm 39 extending radially therefrom.

25 This arm 39 is closely adjacent one end of the roller 18\*, the adjacent face of which has pivoted thereto at 40 two oppositely disposed dogs 41 each normally pressed outwardly by means of a spring 42.

30 As the shaft 36 revolves the arm 39 is adapted to engage the end 43 of one of the dogs 41 and rotate the drum 18\* through a half revolution thereby imparting movement to the conveyor belt 17.

When the dog 41 reaches its lowest position during the rotation of the drum 18\*, a cam member 41\* thereon will come into contact with a roller 44 and force the dog 41 against the tension of the spring 42 into a recess in an end of the drum 18\* and thereby permit the arm 39 to pass the dog 41, thus discontinuing the rotation of the drum 18\* until said arm 39 comes into contact with the oppositely disposed dog 41.

35 The continued rotation of the arm 39 will then impart another half revolution to said drum 18\*.

40 This discontinuance of the rotation of the drum 18\* occurs just as the boxes 24 reach positions directly underneath the hoppers 13, 13.

This permits the box to come to a standstill for a sufficient period to allow one of the cards in each hopper to be separated from the remaining cards in the stack and be deposited in the box beneath the hopper.

45 The connection between the interrupted gear 35 and the pinion 34 is so timed that when the movement of the conveyor belt 17 is stopped the train of gearing for operating the disks 14 will immediately be actuated and as soon as these disks 14 have made a complete rotation further rotation thereof will be stopped and the conveyor belt 17 will be 50 moved again until the box 24 beneath the first

hopper 13, 13, is moved into a position immediately beneath the next successive hopper.

As the conveyor belt is moved intermittently in this manner each box will successively come to a standstill beneath each one of the 70 hoppers alined above the conveyor belt 17.

Each hopper 13, 13 has a stack of like cards therein and the cards in each hopper are unlike the cards of every other hopper, consequently as each box stops beneath each hopper and has a card delivered thereto from 75 each hopper it is obvious that at the delivery end of the machine the box 24 will contain a plurality of cards all different from each other.

80 While in this description cards only are mentioned as being disposed in the various hoppers, it is obvious that similar flat articles may be disposed therein without changing the scope of the invention.

85 For instance, envelopes may be substituted for the cards or the stack may be made up of a plurality of envelopes with a card under the flap of each envelope, or the stack may be made up of a plurality of envelopes with 90 cards already inserted therein.

Each of the disks 14 has a substantially radial slot 45 therein near the end of which is an up-turned finger 46.

95 As these disks 14 rotate in the direction of arrow *b* on Fig. 3 of the drawings the fingers 46 will be inserted above the lowermost card in each hopper and cause the card to pass through the slots 45 to a position beneath the disks 14, thereby permitting them to drop into 100 the boxes 24 beneath the hoppers 13, 13, and ready to receive them.

The separating mechanism described is particularly designed for filling boxes with Christmas cards and the like in which it is 105 desired to have all of the cards different.

In practice a card is inserted beneath the flap of an envelope and in this condition a stack is made up for each hopper 13, 13, the envelopes with the cards extending beneath 110 the flap thereof being placed in the hoppers with the flap uppermost and toward the feeding end of the conveyor belt.

When the disks 14 rotate the finger 46 will be inserted above the flap of the envelope so 115 that the envelope with the card thereon will easily pass through the slots 45 of the rotating disk 14.

To operate the machine it requires three 120 operators, one at the side of the machine to keep the various hoppers filled with cards or envelopes with cards thereon, another operator at the feeding end of the conveyor to place empty boxes on the conveyor in front 125 and between the sides of the U-shaped box-registering devices 23, and the third operator at the delivery end of the conveyor to remove the filled boxes and place covers on the same, these boxes then being ready for shipment. 130

It is believed that the operation and many advantages of the invention will be understood without further description.

Having thus described my invention, I claim:

1. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of card hoppers above said conveyor open at the bottom; and rotatable means interposed between the hoppers and conveyor for separating the lowest card from the remaining cards in each hopper and depositing it in a box on said conveyor.
2. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for intermittently moving said conveyor; a plurality of card hoppers above said conveyor with open bottoms slightly above the tops of said boxes; and rotatable means interposed between the hoppers and the tops of said boxes for separating the lowest card from the remaining cards in each hopper and depositing it in a box on said conveyor.
3. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of card hoppers above said conveyor open at the bottom; and a pair of rotatable slotted disks interposed between the hoppers and the tops of said boxes for separating the lowest card from the remaining cards in each hopper and depositing it in a box on said conveyor.
4. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of card hoppers above said conveyor open at the bottom; means interposed between the hoppers and the tops of said boxes for separating the lowest card from the remaining cards in each hopper and depositing it in a box on said conveyor; and means for temporarily stopping said conveyor with a box beneath each hopper.
5. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of card hoppers above said conveyor open at the bottom; a pair of slotted disks beneath each hopper and immediately above the tops of said boxes rotatable in opposite directions, each disk being provided with an upwardly bent finger adapted to be inserted above the lowest card in each hopper to separate it from the other cards and deposit it in a box on said conveyor; and means for rotating said disks.
6. The combination of an endless conveyor; a box-registering device thereon adapted

to position removable boxes on said conveyor; means for moving said conveyor; a plurality of hoppers above the tops of the boxes on said conveyor each adapted to contain a stack of like cards; means for automatically selecting one card from each hopper and depositing it in the same box during the movement of said conveyor; and means for temporarily stopping said conveyor when said box registers with the bottom of each hopper.

7. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of hoppers above the tops of the boxes on said conveyor each adapted to contain a stack of like cards; and a pair of rotatable members beneath the bottom of each hopper for automatically selecting one card from said hopper and depositing it in the same box during the movement of said conveyor.

8. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of hoppers above the tops of the boxes on said conveyor each adapted to contain a stack of like cards; a pair of rotatable members beneath each hopper for automatically selecting one card from each hopper and depositing it in the same box during the movement of said conveyor; and means for actuating all of said rotatable members simultaneously.

9. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means at one end of said conveyor for intermittently moving it; a plurality of aligned card hoppers above said conveyor open at the bottom and beneath which the boxes in said registering devices are adapted to travel; and movable means interposed between each of the hoppers and the tops of said boxes for separating the lowest card from the remaining cards in the hopper and depositing it in one of said boxes.

10. The combination of an endless conveyor; upwardly extending U-shaped projections thereon to receive removable boxes; means for moving said conveyor; a plurality of card hoppers above the boxes on said conveyor open at the bottom; and a pair of rotatable slotted disks interposed between the hoppers and said boxes for separating the lowest card from the remaining cards in each hopper and depositing it in one of said boxes, the combined length of said slots being greater than the width of said card.

11. The combination of an endless conveyor; upwardly extending U-shaped projections thereon to receive removable boxes; means for moving said conveyor; a plurality of card hoppers above the boxes on said

- conveyor open at the bottom; rotatable means provided with radial slots interposed between the hoppers and said boxes for separating the lowest card from the remaining cards in each hopper and depositing it in one of said boxes, the combined length of said slots being greater than the width of said card; and means for temporarily stopping said conveyor with a box beneath each hopper.
12. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of card hoppers above said conveyor open at the bottom; a pair of slotted disks beneath each hopper, each provided with an upwardly bent separating finger; vertical shafts to which said disks are secured; gears on said shafts rotatable in opposite directions; and gearing for intermittently imparting rotation to said gears whereby said fingers are adapted to be inserted above the lowest card in each hopper to separate it from the remaining cards and deposit it in a box on said conveyor.
13. The combination of an endless conveyor; box-registering devices thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of aligned card hoppers above said conveyor and open at the bottom; and rotatable means immediately beneath said hopper and supporting the cards therein adapted to remove the lowest card in each hopper and deposit it in a box as said box passes successively beneath all said hoppers.
14. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; means for moving said conveyor; a plurality of hoppers with open bottoms above the tops of the boxes on said conveyor and each adapted to contain a stack of like cards; and rotatable means immediately beneath each hopper adapted to support the stack and during rotation thereof select one card from said hopper and deposit it in a box carried by said conveyor.
15. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; a plurality of hoppers above the conveyor and containing a stack of cards; means for moving said conveyor temporarily, stopping it with a box beneath each hopper; and means for automatically selecting one card from each hopper and depositing it in the same box while the conveyor is at a standstill.
16. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; means for moving said conveyor a predetermined distance and then bringing it to a standstill; a plurality of hoppers above said conveyor and each adapted to contain a stack of like cards; a pair of rotatable members for automatically selecting one card from each hopper and depositing it in the same box during the movement of said conveyor; and means for actuating said members only when the conveyor is at a standstill.
17. The combination of an endless conveyor; a box-registering device thereon adapted to position removable boxes on said conveyor; means for moving said conveyor a predetermined distance and then bringing it to a standstill; a plurality of hoppers above said conveyor and each adapted to contain a stack of like cards; a pair of rotatable members beneath each hopper for automatically selecting one card from each hopper and depositing it in the same box during the movement of said conveyor; and means for actuating all of said rotatable members simultaneously while said conveyor is at a standstill and causing them to stand still during the movement of the conveyor.
- Signed by me at 294 Washington St., Boston, Massachusetts, this 7th day of June, 1928.
- JOHN J. MURRAY.