March 17, 1959 W. H. WHEELER, JR 2,877,885

LETTER FEEDING DEVICE

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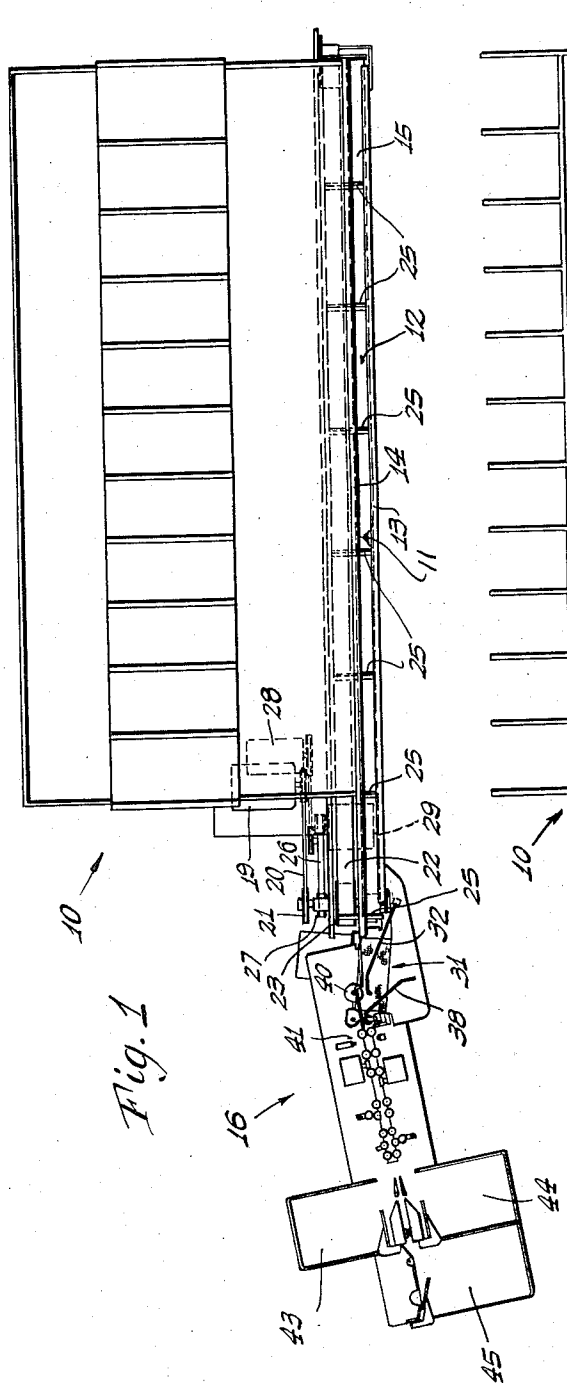


Fig. 1

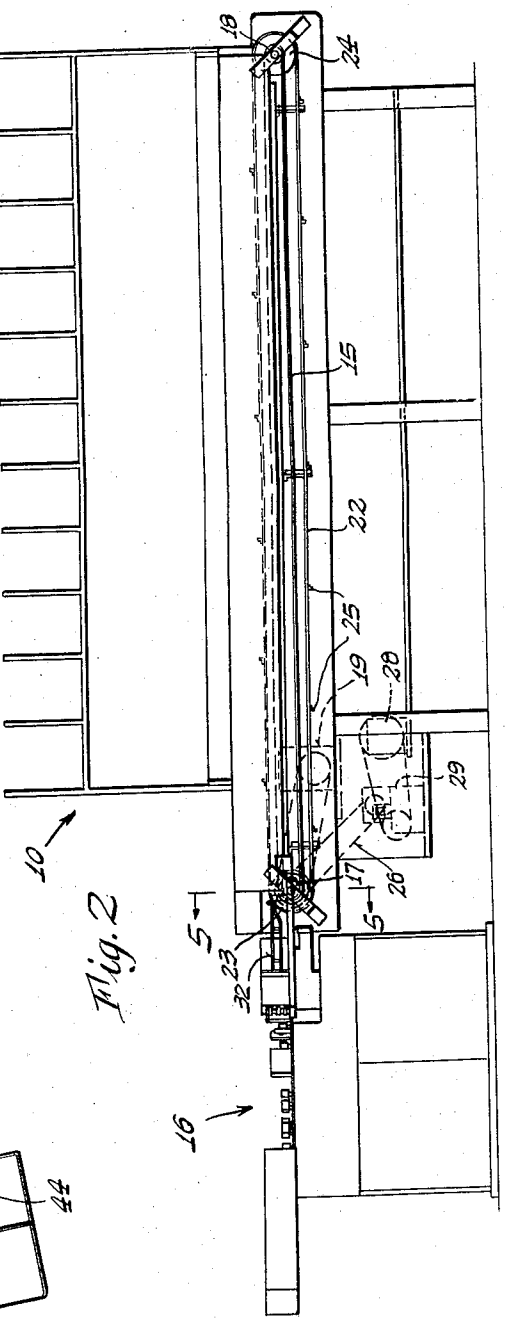


Fig. 2

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Fig. 3

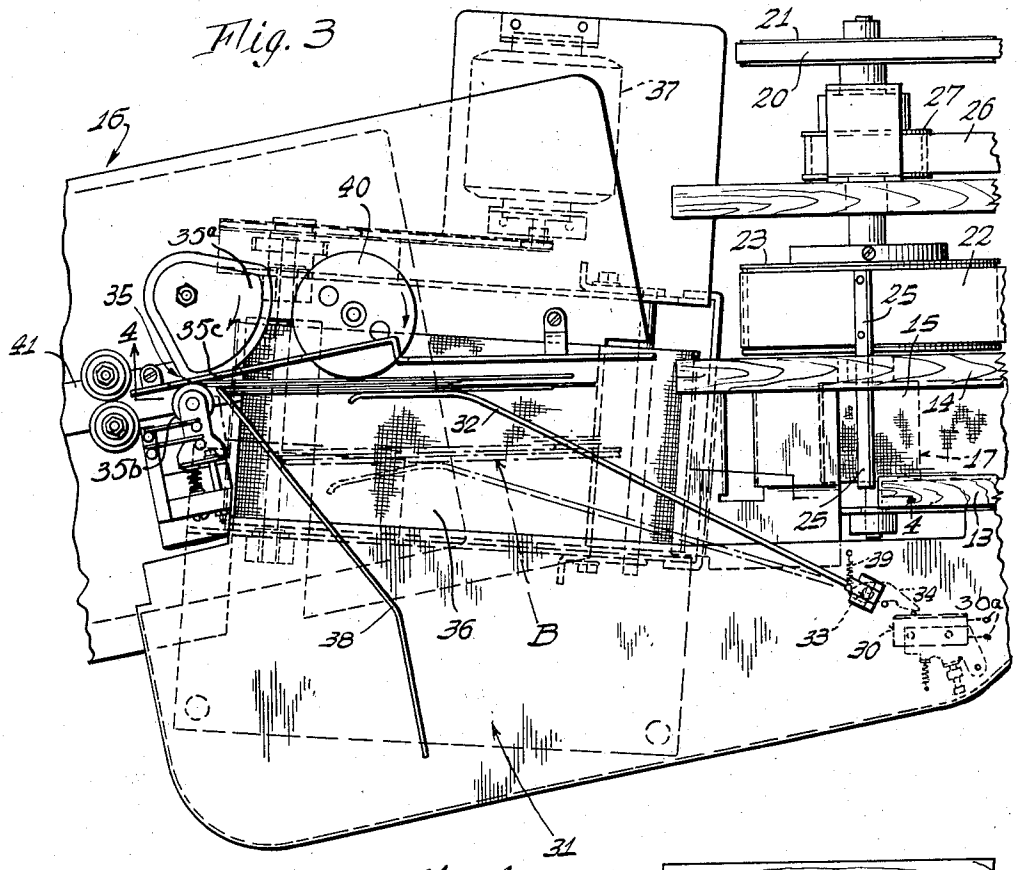
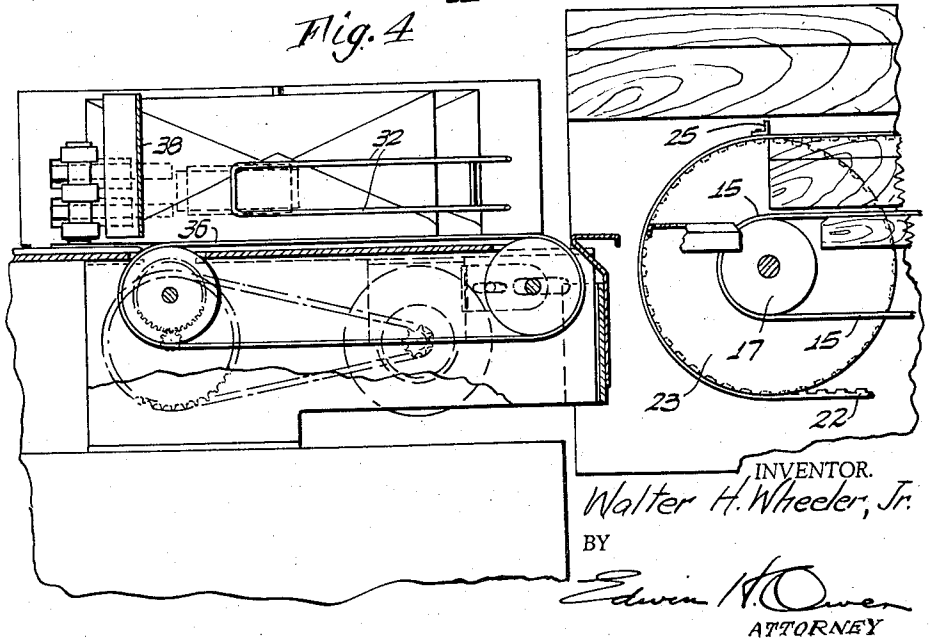


Fig. 4



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Fig. 5

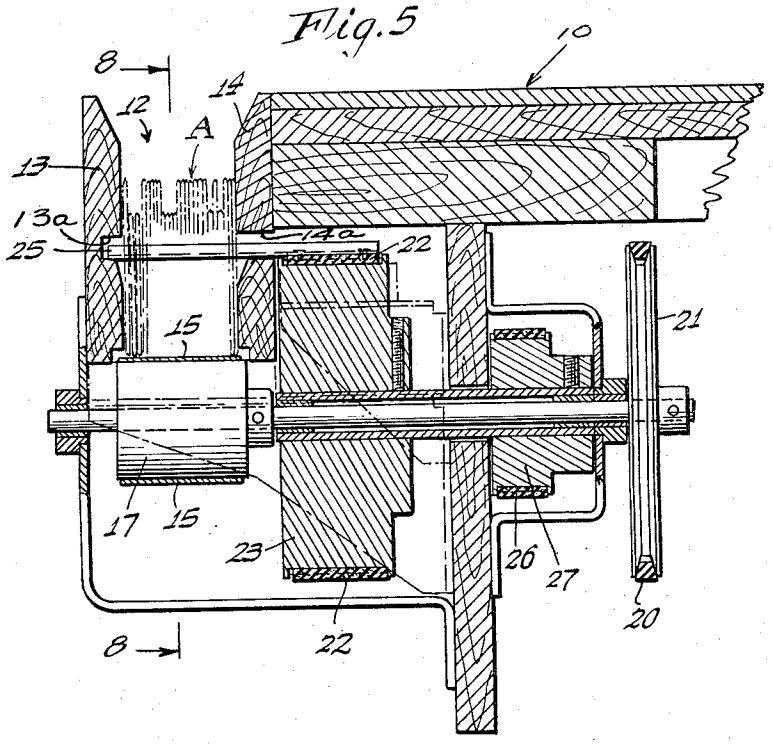


Fig. 6

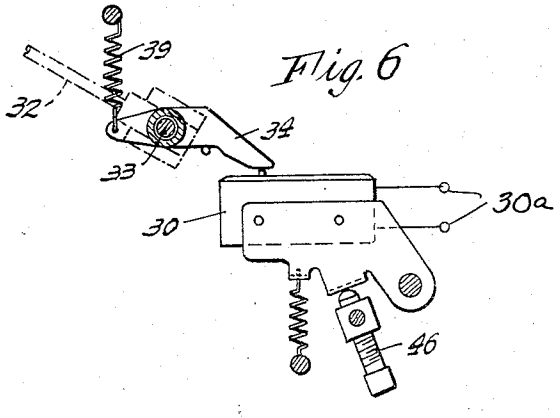
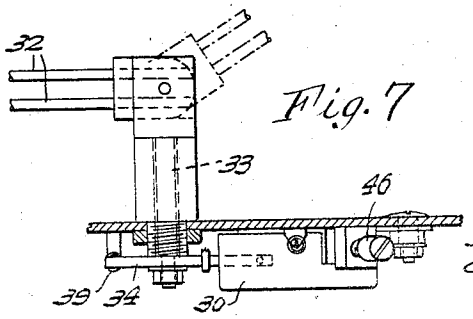


Fig. 7



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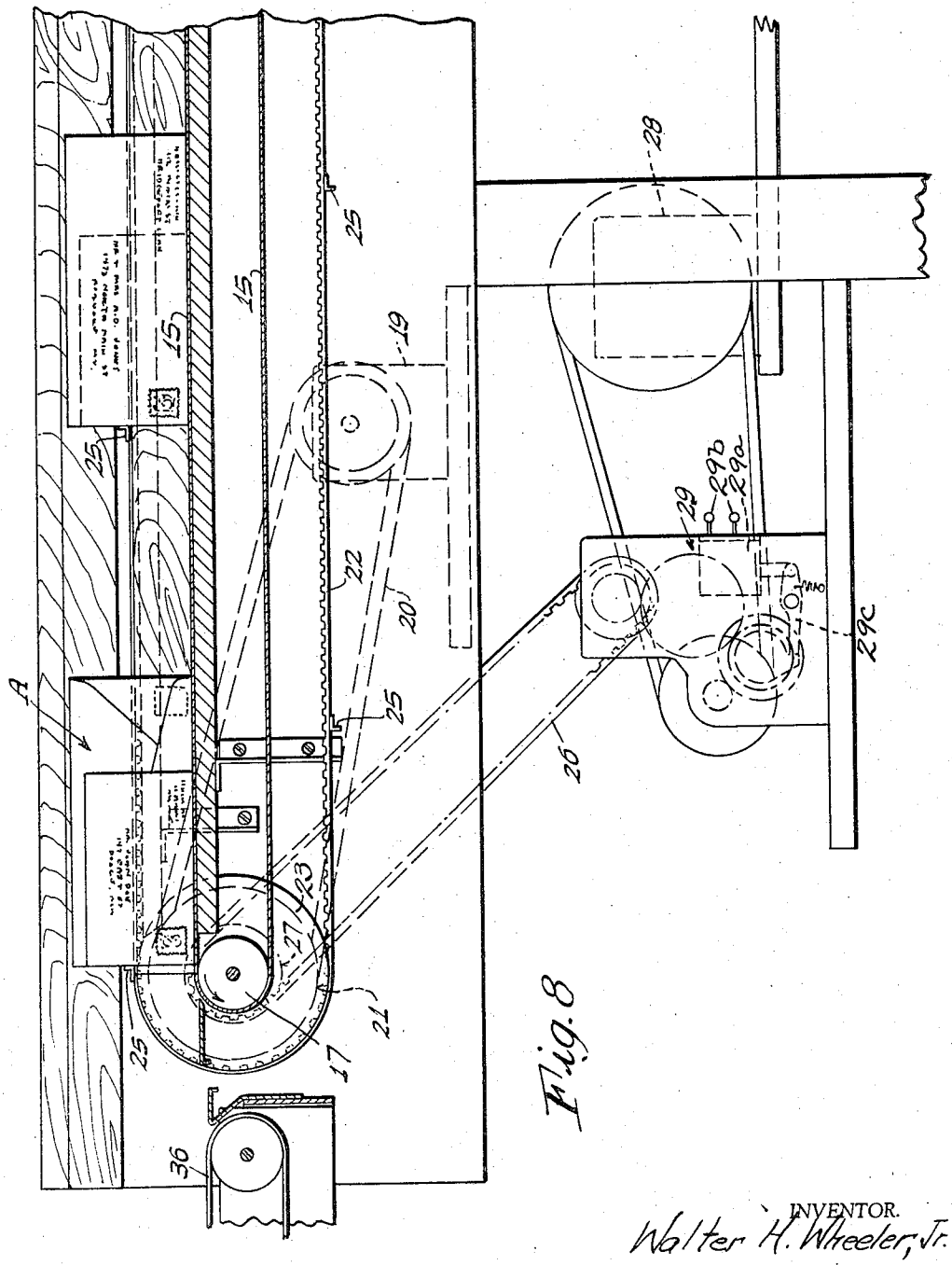


Fig. 8

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2,877,885

LETTER FEEDING DEVICE

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Application August 12, 1957, Serial No. 677,729

9 Claims. (Cl. 198—37)

This invention relates to a new and improved method for handling mail and more particularly to an improved apparatus for conveying letter mail in bunches from a mail receiving or sorting table to the letter feed position of a stamp cancelling machine.

In the past the practice has been to empty bags of mail upon large sorting tables after which considerable manual handling was necessary to face letters and arrange them in proper position for stamp cancelling. Long letters were also separated from short letters.

By means of the present invention a novel conveyor system is combined with a mail sorting table from which letters are manually gathered in bunches without regard to length or stamp location and are dropped on their lower long edges into conveyor pockets to be conveyed in such bunched order to a letter feed and separating position of a stamp cancelling machine.

The mail sorting table has a channel along the front edge thereof and a continuously running conveyor belt at the channel bottom. An intermittently operated conveyor cooperates with the continuously running conveyor and has means extending above the continuous conveyor belt which provides pockets for the reception of the bunches of letters. The letters are supported in a vertical position along their lower edges on the continuously running belt but are delivered to the cancelling machine under control of the intermittent conveyor. With this arrangement, mail clerks pick up letters in bunches from the mail table and drop them in the pockets of the intermittent conveyor. Thereafter, letter feeding, separating and cancelling operations are automatically accomplished.

It is the principal object of the invention therefore to provide means for simplifying the operations of mail handling by mail clerks when preparing letters for processing by stamp cancelling machines.

It is another object to provide means whereby letters may be picked up in bunches by mail clerks from a mail sorting table and dropped into a conveying device which will deliver said bunches to a feeding and separating position of a stamp cancelling machine as required.

Accordingly, it will be seen that this invention provides automatic operating means for presenting bunches of letters to a cancelling machine for ready individual processing thereby.

Other features and objects of this invention will be found in the following description and accompanying drawings where a preferred form thereof is shown and in which:

Fig. 1 is a top plan view of one embodiment of the invention;

Fig. 2 is a front elevation of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged fragmentary plan view of the exit end of the conveying device similar to Fig. 1;

Fig. 4 is a fragmentary front elevation of the exit end of the conveying device taken on line 4—4 of Fig. 3;

Fig. 5 is a section taken on the line 5—5 of Fig. 2,

showing details of the structure associated with the conveying apparatus;

Fig. 6 shows details of demand feed electrical switching mechanism;

Fig. 7 is a front view of the switching mechanism of Fig. 6; and

Fig. 8 is a section taken on the line 8—8 of Fig. 5 and also showing a portion of the intermittently operated driving means.

Referring now to the drawings where an exemplary embodiment of the invention is shown in detail, a mail sorting table, generally shown at **10**, has the contents of bags of mail dumped thereon. After bundles of metered mail, air mail letters, packages and the like are culled out, the remaining letters are ready for the attention of the mail clerks. Several clerks stand along the conveyor side of the table, each clerk having access to letters piled within reaching distance in front of him.

The conveyor is generally indicated at **11**, Fig. 1, and runs parallel to and along the front edge of the mail table. Said conveyor comprises a continuously moving belt **15** mounted on conventional pulleys **17**, **18**, the pulley **17** being driven continuously by appropriate electric motor power means **19** (shown in outline only) through belt **20** and pulley **21**, as best shown in Fig. 8. Walls **13** and **14**, above the surface of the belt **15**, provide a channel, as generally indicated at **12**, Fig. 5.

A second or auxiliary belt **22**, mounted on pulleys **23** and **24** coaxially with, but larger in diameter than, pulleys **17** and **18**, is located to the rear of belt **15**, as clearly shown in Fig. 5. Said belt **22** is provided with spacing bars **25** which extend beyond the edge of belt **15** and divide the space above belt **15** into sequentially arranged pockets for receiving the individual bunches of letters as picked up by the mail clerks. The bars **25** extend through a slotted portion **14*a*** in the wall **14** and the ends thereof extend into a groove **13*a*** in the wall **13**.

The belt **22** is driven intermittently on demand through toothed belt **26** and toothed pulley **27** by power means **28** and is controlled by a solenoid actuated one revolution clutch drive generally indicated at **29**, Fig. 8. Actuation of the solenoid is effected whenever the supply of letters in a supply hopper **31** at the feeding and separating position of the cancelling machine **16** has been reduced to a determined number. In Fig. 3 this condition is clearly illustrated by the position of a follower arm element **32** which is urged against the last few of a group of letters, at which time a lever **34**, pivoted at **33**, is rocked to a position to close an electrical microswitch **30**. Suitable electrical connections are provided between contacts **30*a*** of said switch **30** (Fig. 6) to a source of current and to contacts **29*b*** of the solenoid **29*a*** shown in Fig. 8.

The solenoid **29*a*** is thus energized to release a clutch stop **29*c*** and thus effect the drive of the belt **22** a distance equivalent to the length of one pocket.

After a bunch of letters A is dropped into the space between any two bars **25**, the lower long edges of the letters upon engaging the moving belt **15** will be moved by said belt until the leading edges of the letters engage the leading of the two bars **25**, as best seen in Fig. 8. When the belt **22** moves, the bunch of letters in the leading pocket will be advanced beyond the end of the belt **15**, where it passes over pulley **17**. After leaving the latter position, the said bunch of letters is advanced by a moving conveyor belt **36** to the cancelling machine feed and separating position to occupy the dot and dash line position indicated in Fig. 3 at B.

The bunch of letters is thus moved against the follower arm **32**, and rocks lever **34** away from the switch closing

position to open the circuit of microswitch 30 and de-energize the solenoid 29a.

The follower arm 32, biased by spring 39, also serves to hold the letters upright on their edges with a light pressure until the letters are extracted one by one by the feed and separator elements generally indicated at 35. When the bunch of letters is reduced to the number where the microswitch 30 and solenoid 29a are again energized, a new bunch of letters will be fed to the feed and separating elements 35.

After the foremost letter clears the feed and separator elements 35 the next foremost letter is urged by a frictional surfaced feed wheel 40 to a starting position. The leading edge of the foremost letter will normally wedge between a fixed fence portion 35c and a yieldable separator roller 35b where it will remain until the feed segment 35a moves into contact with the letter to advance same. By means of this arrangement, the letters stored in the supply hopper 31 are rapidly and automatically fed one at a time into the feed wheels 41 of the cancelling machine generally indicated at 16.

The cancelling machine 16 may be of any suitable kind. However, as shown in the drawings, the cancelling machine is preferably of the type disclosed in copending application Serial No. 636,032. Referring to Fig. 1, said cancelling machine is adapted to separate letters which have stamps at the lower leading edge into one stacker unit 43, those with stamps at the lower trailing edge into another stacker unit 44, and those not having the stamp positioned at the lower edge of the letter are separated into still another stacker unit 45.

In its broadest aspects, this invention provides for a conveyor system which is adapted to receive letters manually removed in bunches from a sorting table and dropped on a continuously moving belt. Bars attached to an intermittently moving second belt extend over and separate the surface above said continuously moving belt into pockets. The device feeds the said bunches of letters to a stamp cancelling machine on demand, the latter feature comprising sensing means whereby, when the number of letters awaiting separation and cancellation is reduced to a predetermined minimum, automatic means is actuated to cause the intermittently moving belt to advance and allow a new bunch of letters to emerge from the conveyor and be fed into the cancelling machine. The leading edges of each bunch of letters are aligned as a result of the movement of one belt of the conveyor which moves the edges of the letters against the lead bar of each pocket, and the presentation of said bunches of letters follows a pattern normally used in manually presenting letters to a stamp cancelling machine.

While in order to comply with the statute the invention is described in language which is rather specific as to structural features and arrangements, it is to be understood that the invention is not limited to the specific details shown, but that the means and method herein disclosed comprises the preferred of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the scope of the language employed in the appended claims.

What is claimed is:

1. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position, of a device for advancing letters in bunches to the letter feeding position comprising a conveyor having sequentially arranged pockets located in close relation to the mail sorting table whereby a mail clerk may pick up letters from the mail table in bunches and drop them on edge into said pockets, means for advancing said conveyor intermittently to thereby advance one bunch of letters at a time to the letter feeding position, and control means for said advancing means operable to advance the conveyor a determined distance when the number of letters at the letter feeding position has been reduced to a predetermined number.

2. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position, of a device for advancing letters in bunches to the letter feeding position comprising a conveyor having sequentially arranged pockets located in close relation to the mail sorting table whereby a mail clerk may pick up letters from the mail table in bunches and drop them on edge into said pockets, intermittently controlled means for advancing said conveyor to thereby advance one bunch of letters at a time to the letter feeding position including electrically operated switching means associated with the letters at the feeding position, and a solenoid actuated clutch drive for said conveyor connected with the switching means and operable to effect a drive when the letters at the feeding position have been reduced to a predetermined number.

3. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position, of a device for advancing letters in bunches to the letter feeding position comprising a conveyor supported along one edge of the mail sorting table and having sequentially arranged pockets whereby mail clerks may stand along said conveyor and pick up letters from the mail table in bunches and drop them on edge into said pockets, and means including a demand control device operable when the letters remaining at the letter feeding position have been reduced to a predetermined number for advancing said conveyor a determined distance to thereby advance one bunch of letters at a time to the letter feeding position as required.

4. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position; of a device for feeding letters in bunches to the letter feeding position comprising a conveyor supported along one edge of the mail sorting table and including a continuously running belt, one surface of which provides a base for the support of the bunches of letters; and an intermittently movable belt having bars extending outwardly therefrom in spaced relation and movable with the belt along a plane above the letter supporting surface of the first named belt, whereby pockets are provided into which letters may be dropped on their longer edges in bunches without orienting; and means for advancing the intermittently movable belt a determined distance as required to maintain a continuous supply of letters at the letter feed position of the stamp cancelling machine.

5. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position; of a device for feeding letters in bunches to the letter feeding position comprising a conveyor supported along one edge of the mail sorting table; said conveyor comprising a continuously running belt, one surface of which provides a base for the support of the bunches of letters; and an intermittently movable belt having bars spaced thereon and extending outwardly therefrom along a plane above the letter supporting surface of the first named belt, whereby pockets are provided into which letters may be dropped on their longer edges in bunches without orienting; a drive for said intermittently movable belt including a one revolution clutch, a clutch stop, and clutch stop tripping means associated with the letter feed means operable periodically to maintain a continuous supply of letters at the letter feed position.

6. The combination with a letter mail sorting table and a stamp cancelling machine having continuously operative letter feed means; of a hopper to maintain a supply of letters in a feeding position relative to the feed means of the cancelling machine; a follower arm urged to apply a yieldable pressure against the last letter of the supply; means for maintaining a continuous supply of letters in said hopper comprising a conveyor sup-

ported along one edge of the mail sorting table; said conveyor comprising a continuously running belt, one surface of which provides a base for the support of the bunches of letters; and an intermittently movable belt having bars spaced thereon and extending outwardly therefrom along a plane above the letter supporting surface of the first named belt, whereby pockets are provided into which letters may be dropped on their longer edges in bunches without orienting; and means controlled by the follower arm when a minimum supply of letters remains in the hopper to effect the drive of the intermittently movable belt the distance necessary to discharge the bunch of letters contained in the lead pocket of the conveyor to a position behind the follower arm.

7. The combination with a letter mail sorting table and a stamp cancelling machine having continuously operative letter feed means; of a hopper to maintain a supply of letters in a feeding position relative to the feed means of the cancelling machine; a follower arm urged to apply a yieldable pressure against the last letter of the supply; means for maintaining a continuous supply of letters in said hopper comprising a conveyor supported along one edge of the mail sorting table; said conveyor comprising a continuously running belt, one surface of which provides a base for the support of the bunches of letters; and a second belt movable at intervals and having bars spaced thereon and extending outwardly therefrom along a plane above the letter supporting surface of the first named belt, whereby pockets are provided into which letters may be dropped on their longer edges in bunches without orienting, electrically operated switching means movable to a circuit closing position by the follower arm when a minimum supply of letters remains in the hopper; and a solenoid operated clutch controlled by the switching means to effect the drive of the last named belt the distance necessary to discharge the bunch of letters contained in the lead pocket of the conveyor to a position behind the follower arm.

8. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position; of a conveying device associated with the mail sorting table for advancing letters in bunches to the letter feeding position with their forward edges aligned; and comprising a continuously running belt, one surface of which provides a base for the support of the letters on edge; and an intermittently movable belt having pocket forming members spaced thereon and extending therefrom along a plane above the letter supporting surface of the first named belt and in the path of letters supported thereon, whereby the leading edges of a bunch of letters within any pocket area are aligned by their forced engagement with the lead member of any pair of pocket forming members as effected by the movement of the first named belt.

9. The combination with a letter mail sorting table and a stamp cancelling machine having a continuously operative letter feeding position; of a conveying device associated with the mail sorting table for advancing letters in bunches to the letter feeding position with their forward edges aligned; and comprising a continuously running belt, one surface of which provides a base for the support of the letters on edge; an intermittently movable belt having pocket forming members spaced thereon and extending therefrom along a plane above the letter supporting surface of the first named belt and in the path of letters supported thereon, whereby the leading edges of a bunch of letters within any pocket area are aligned by their forced engagement with the lead member of any pair of pocket forming members as effected by the movement of the first named belt; and means operable when a determined minimum number of letters at the letter feeding position has been reached to advance the intermittently movable belt and thereby move the leading bunch of letters to the letter feeding position.

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