Dec. 11, 1962 J. F. CATTORINI ET AL 3,067,998

CHECK FEEDING MECHANISM

Filed Oct. 12, 1959

2 Sheets-Sheet 1

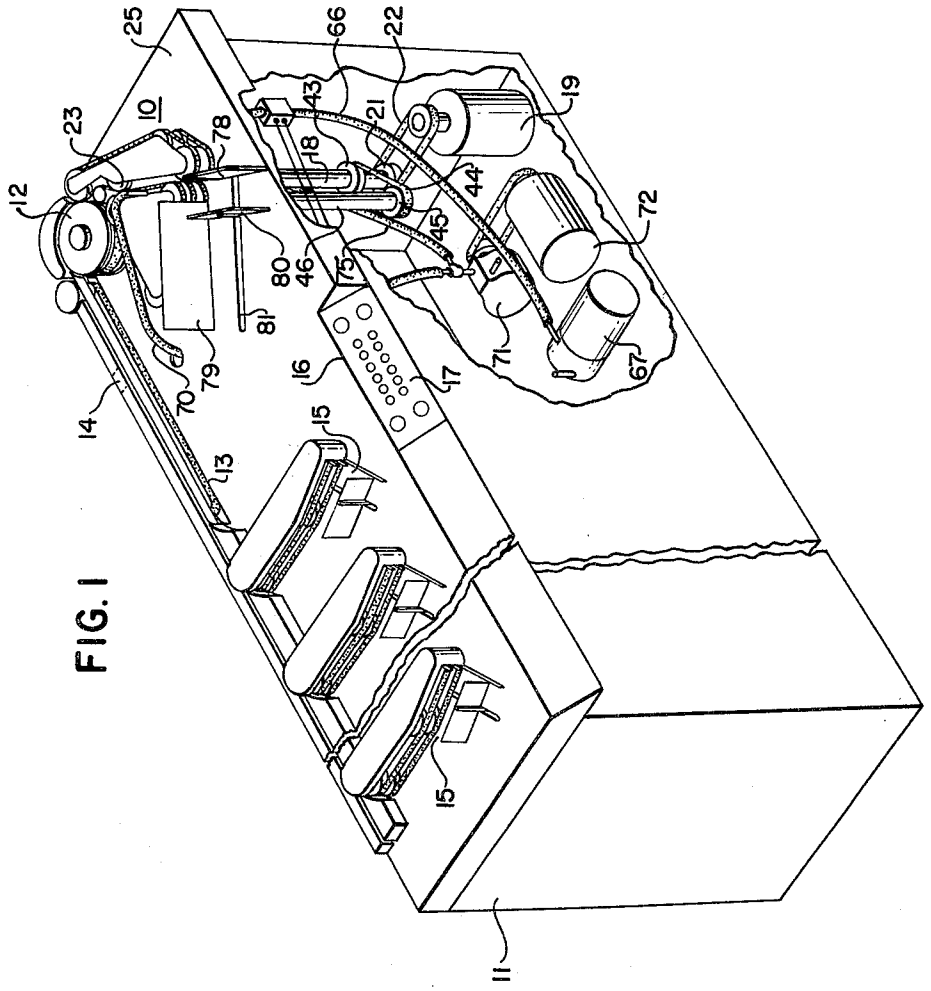


FIG. 1

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2 Sheets-Sheet 2

FIG. 2

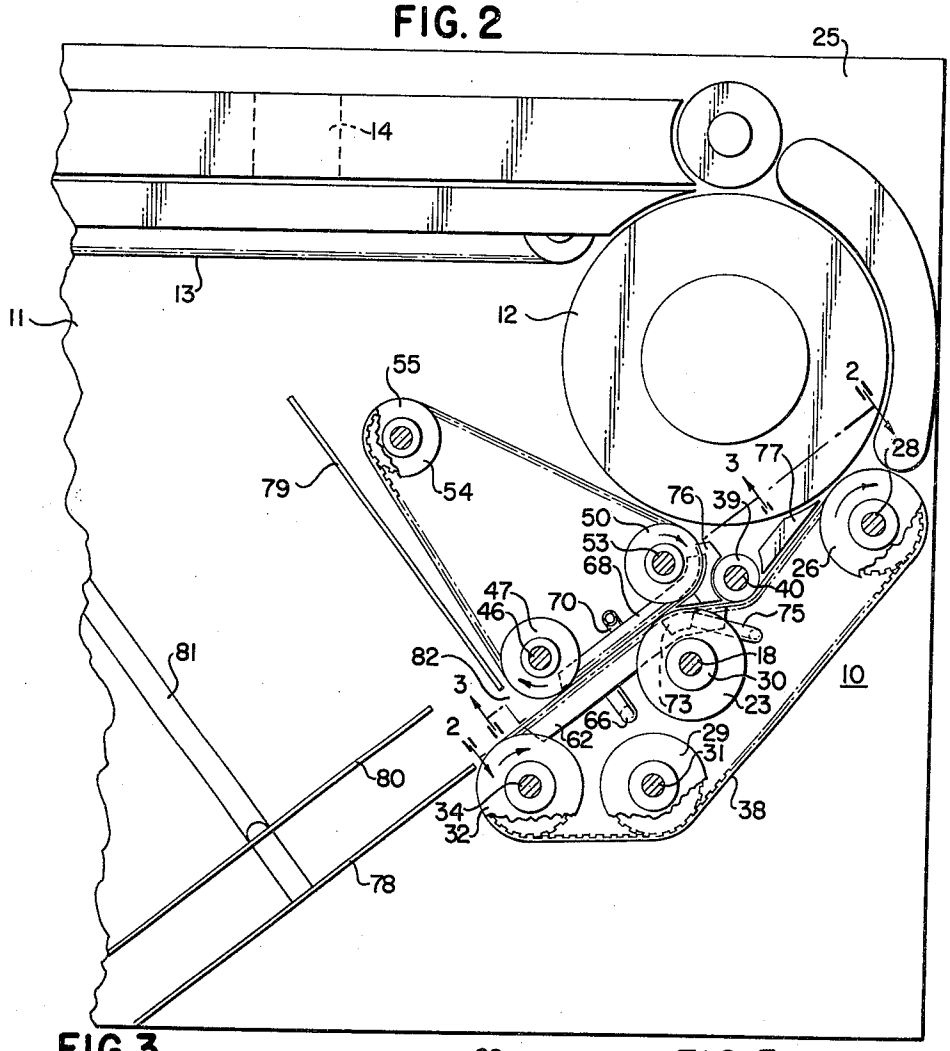


FIG. 3

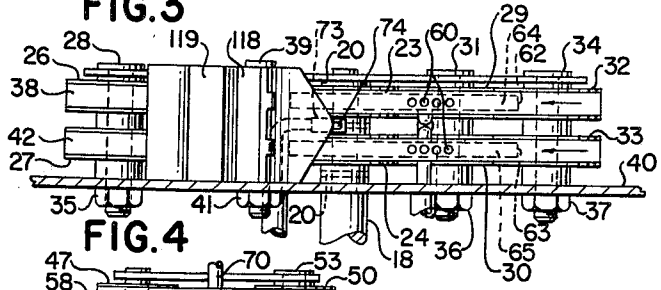


FIG. 4

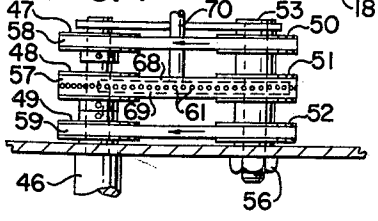
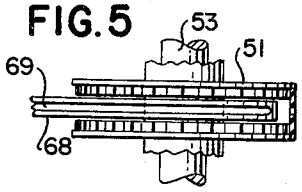


FIG. 5



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3,067,998

CHECK FEEDING MECHANISM

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6 Claims. (Cl. 271—12)

The invention relates to improvements in feeding mechanisms for forms, such as checks.

One prior art sorting apparatus for forms, such as checks, utilized a check-feeding system embodying a belt arrangement. The check-feeding system operated to separate checks of miscellaneous sizes and lengths, and to feed them from a magazine past an identification pickup or reading head, and then into selected pockets of the sorting apparatus. The checks were sorted according to the data read by the pickup head. The check-feeding system of the prior art included a synchronizer device and a check-feeding mechanism. The check-feeding mechanism may be defined as that part of the check-feeding system which separated the checks and delivered them singly to the synchronizer device, where they were properly spaced prior to transportation past the identification pickup head.

In the check-feeding mechanism of the prior art, the checks were fed when they were forced against a moving feed belt and/or feed belts by means of a vacuum acting through ports or openings in this belt. The checks moved between the feed belt and another belt moving in a direction opposite the direction of movement of the feed belt. This latter reverse-direction belt was provided for the purpose of retaining all but a single check in a magazine during one feed cycle; and further for returning any surplus checks or double feeds to the magazine, if the frictional force between the reverse-direction belt and a surplus check was greater than the frictional force between overlapping checks. The prior art check-feeding mechanism utilized an unported reverse-direction belt having a high coefficient of friction. The coefficient of friction of this reverse-direction belt was higher than the coefficient of friction of the feed belt. Accordingly, the checks were held back in the magazine, or prevented from being fed to the synchronizer device by this reverse-direction belt until the vacuum ports on the feed belt caused an increase in the normal force (and hence the frictional force) against inserts of a very high coefficient of friction about the ports in the feed belt.

It has been found that in the prior art check-feeding mechanism, both the feed belt and the reverse direction belt must possess a definite value of coefficient of friction. It has also been found that the spacing between the feed belt and the reverse-direction belt is highly critical.

A serious problem occurred when checks of higher than normal porosity were handled by the feeding mechanism of the prior art. The vacuum acting through the ports in the feed belt caused a pressure differential also to be exerted on the next check to be fed, which forced this next check against the first check, whereby both checks were fed simultaneously to the synchronizer device and a sorting error was incurred. As evidence of this fact, it has been found that, as the amount of the vacuum on the feed belt was increased, the number of double feeds of checks, and hence the sorting errors, also increased.

Another undesirable condition that was caused by the prior art check-feeding mechanism was the wearing of the leading edges of a check by the high coefficient of friction reverse belt. This appreciably decreased the ability of the feeding mechanism to feed checks one at a time during subsequent sorting operations.

However, the greatest shortcoming of the prior are

check-feeding mechanism was occasioned by the change in the coefficient of friction of the feed and reverse-direction belts through wear, glazing, generating heat, etc. As a result, it has been found necessary to change or regenerate the belts quite frequently, resulting in high maintenance costs. It has also been found necessary to adjust the spacing between the feed and reverse-direction belts quite often, especially where forms of different thicknesses were handled by the feeding mechanism.

In accordance with one aspect of the present invention, a continuously ported reverse belt is utilized with the ported feed belt instead of the unported reverse belt of the prior art check-feeding mechanism. A vacuum is applied to the continuously ported belt whereby the checks are retained in the magazine except those checks withdrawn one at a time therefrom by the operation of the ported feed belt. Thus a ported friction reverse belt, supplied with vacuum, is utilized to retain the checks in the magazine, to separate overlapping checks, and to return any double feed to the magazine instead of the purely frictional reverse belt of the prior art. As a result, the feeding mechanism of this invention may utilize a lower coefficient of friction reverse belt, with a consequent lessening of wear to the leading edges of the checks, and the spacing between the feed and reverse belts is not as critical as that of the prior art device.

In accordance with a further aspect of the invention, a vacuum, separate from the vacuum applied to a check through the openings in the feed belts, is applied to a check to separate it from an overlapping or incorrectly fed check. The continuously ported reverse belt is utilized to return the incorrectly fed check toward the magazine and prevent the synchronizer device from receiving a double feed. This latter arrangement is especially useful when checks of extreme porosity are to be handled by the feeding mechanism.

It is, therefore, an object of the present invention to provide a check-feeding mechanism which overcomes the disadvantages of the mechanism of the known prior art, and to provide an improved check-feeding mechanism characterized by a high degree of reliability of operation and reduced maintenance costs.

It is another object of the present invention to provide an improved check-feeding mechanism in which the individual feeding of checks is insured by the use of a continuously ported vacuum reverse-direction belt.

It is a further object of the present invention to provide a check-feeding mechanism which includes improved means for preventing the occurrence of a double feed.

It is a still further object of the present invention to provide an improved check-feeding mechanism in which the spacing between the feed belt and the reverse belt is not highly critical.

With these and incidental objects in view, the invention includes certain novel features of construction and combination of parts, the preferred form or embodiment of which is hereinafter described with reference to the drawings which accompany and form a part of this specification.

Of said drawings:

FIG. 1 is a perspective view of a check-sorting apparatus, showing the check-feeding mechanism supported on the top thereof, with a front portion of the sorting apparatus broken away to reveal means for operating the feeding mechanism.

FIG. 2 is a fragmentary top plan view of the sorting apparatus, showing the check-feeding mechanism of this invention.

FIG. 3 is a detail view taken along the lines 2—2 of FIG. 2.

FIG. 4 is a detail view taken along the lines 3—3 of FIG. 2.

FIG. 5 is an enlarged cutaway detail view of a portion of FIG. 4.

General Description

The invention is illustrated in conjunction with a sorting apparatus for business forms, such as checks. The sorting apparatus includes a synchronizer device, which is provided for properly spacing the checks that are fed to it from the feeding mechanism which is the subject matter of this invention. The synchronizer device comprises a rotatable member provided with projecting portions which effect the proper spacing of the forms. The synchronizer device itself is not a part of the present invention.

The invention comprises a high-speed feeding mechanism to feed business forms, such as checks, from a magazine along a feed path. The feed path may include a synchronizer device of the type previously referred to. From the synchronizer device, the checks are further transported, properly spaced, past an electronic pickup head, and into sorting compartments. The feeding mechanism is such that checks of miscellaneous sizes—that is, lengths and widths—can be inserted into a magazine, and thereafter fed from the magazine one at a time in rapid succession.

The checks are fed out of the magazine by use of vacuum. A pair of spaced and parallel feed belts are so positioned that they pass adjacent the mouth of the magazine, along one side of a feed path for the forms. The feed belts each have openings therein along a portion of their length, and the openings in one feed belt are in alignment with the openings of the other feed belt. A hollow vacuum member or shoe is positioned adjacent each of the feed belts along the feed path, and a means for exhausting air in these vacuum members is provided. The vacuum members are operable in cooperation with the openings in the feed belts to normally cause one check at a time to be withdrawn from the magazine and to be moved along the feed path. The withdrawn check is held in contact with the feed belts by the vacuum applied thereto through the openings in the feed belts.

To prevent more than one check from being withdrawn from the magazine at any one time, use is made of vacuum. A reverse belt is positioned adjacent the area between the feed belts and passes along the other side of the feed path. The reverse belt is movable in an opposite direction to the direction of movement of the feed belts. In accordance with the invention, the reverse belt is provided with a series of openings therein throughout its entire length. A hollow vacuum member or shoe is positioned adjacent the reverse belt along the reverse belt side of the feed path, and a means for exhausting air in the vacuum member is provided. The vacuum member is operable in cooperation with the openings in the reverse belt to cause the checks to be retained in the magazine except those checks withdrawn therefrom by the operation of the vacuum members associated with the feed belts cooperating with the openings in the feed belts.

If more than one check should be withdrawn from the magazine at any one time because of the porosity of the type of check handled, the foregoing reverse belt will also function as a return belt; that is, any check not directly influenced by the vacuum applied through the openings in the feed belts will contact the return belt and be returned to the magazine by the effect of the vacuum applied to this check through the vacuum member associated with the return belt.

Further, in accordance with the invention, the check-feeding mechanism utliizes another vacuum, which is applied through an additional hollow vacuum member directly to a check to separate it from an overlapping form. If extremely porous types of checks are handled, more than one check may be withdrawn from the magazine at a time, and the vacuum applied through the openings in the feed belts may influence another check to such a degree that it is not stripped off the first check by the vacuum applied thereto through the openings in the return belt. Such a double feed or overlapping check would continue along the feed path and result in a sorting error. The additional vacuum member is positioned at a point adjacent the feed belt side of an initial portion of the feed path for the checks. The feed and return belts pass in a substantially parallel relationship along the initial portion of the feed path. The vacuum member is positioned at a point of the initial portion of the feed path where the parallel relationship of the feed and return belts terminates. A means for exhausting air in the vacuum member is provided. The vacuum member is operable to cause any check being moved along the initial portion of the feed path, under the direct influence of the vacuum applied thereto through the openings in the feed belts, to be diverted to a succeeding portion of the feed path independently of any other check which is not so directly influenced. The second check will contact the return belt and will be returned to the magazine by the effect of the vacuum applied to it through the vacuum member associated with the return belt. The attractive force developed by the return belt vacuum is made smaller than the attractive force developed by the vacuum of the additional vacuum member, so that a single form may be diverted to the succeeding portion of the feed path.

The invention permits all the belts used in the feeding mechanism to be fabricated of the same material. Thus, all the belts will be affected similarly by temperature, and show the same wear, glazing, and so on. Furthermore, the coefficient of friction of the feed and reverse belts can theoretically be of any value. Practically, though, their values should not be lower than the paper-to-paper coefficient of friction. The use of belts of lower coefficient of friction than the belts utilized in the prior art feeding mechanism aids immeasurably in the elimination of the heretofore-mentioned wearing of the checks by the reverse belt.

Detailed Description

The feeding mechanism is indicated generally by the refence numeral **10**. It is shown in FIG. 1 mounted on the top right side of a sorting apparatus **11**. The sorting apparatus **11** includes a rotatable synchronizer device **12**, which is provided for properly spacing the checks that are fed to it from the feeding mechanism. Upon leaving the synchronizer device **12**, the checks are transported by a belt system indicated generally at **13** past a pickup device indicated generally at **14**, and then to the various sorting compartments **15**. The checks are delivered into the compartments **15** in accordance with the data recorded thereon.

A control panel **16** is provided with various switches, indicated generally by the numerals **17**, which control starting and shutdown of the sorting apparatus, and feeding of the checks.

The feeding mechanism is operated through a main shaft **18**, which is rotated by a motor **19**. The main shaft **18** is rotatably mounted in a pair of bearings **20**. Secured to the shaft **18** is a pulley **21**, which has a motor drive belt **22** wound around it. The pulley **21** is rotated clockwise when it is operated by the motor **19**, or by any other power source. Also secured to the shaft **18** are a pair of pulleys **23** and **24**, which are located on the top **25** of the sorting apparatus. Associated with the pulleys **23** and **24** are the pulleys **26** and **27**, mounted on a stud **28**; the pulleys **29** and **30**, mounted on a stud **31**; and the pulleys **32** and **33**, mounted on a stud **34**. Each of the studs **28**, **31**, and **34** is mounted in a pair of bearings and is secured to the top **25** of the sorting apparatus by means of the bolts **35**, **36**, and **37**, respectively.

A feed belt **38** is wound around the pulleys **26**, **29**, **32**, and **23**. Associated with the feed belt **38** is a roller **39**,

mounted on a stud 40, which is secured to the top 25 of the sorting apparatus by means of the bolt 41. The feed belt 38 passes from around the pulley 32, around the pulley 23, adjacent the roller 39, around the pulleys 26 and 29, to the pulley 32.

Another feed belt 42 is associated with the pulleys 27, 30, 33, and 24 and the roller 39 in a similar manner.

Secured to the main shaft 18 is a pulley 43. A drive belt 44 is wound around the pulley 43 and another pulley 45, which is secured to a shaft 46. The shaft 46 is rotatably mounted and extends above the top 25 of the sorting apparatus. The pulley 43 is rotated clockwise when it is operated by the motor 19.

Secured to the portion of the shaft 46 which extends above the top 25 of the sorting apparatus are three spaced pulleys 47, 48, and 49. Associated with these pulleys are the pulleys 50, 51, and 52, mounted on a stud 53, and three other pulleys (one pulley 54 is shown in FIG. 2) mounted on a stud 55. The studs 53 and 55 are secured to the top 25 of the sorting apparatus by means of bolts. For instance, the bolt 56 is used for the stud 53.

The reverse or return belt 57 (FIG. 4) is wound around the pulleys 51 and 48, and around the middle pulley (not shown) attached to the stud 55. The return belt 57 passes from around the pulley 48, around the middle pulley (not shown) on the stud 55, and around the pulley 51 to the pulley 48. An upper guide belt 58 and a lower guide belt 59 are associated with the pulleys 47, 50, and 54, with the pulleys 49 and 52, and with the lower pulley (not shown) of the stud 55, respectively, in a similar manner.

The feed belts 38 and 42 are provided with openings or ports 60 (FIG. 3) throughout a portion of their length. The feed belts are adjusted so that the openings in one belt are in alignment with the openings in the other belt.

The reverse belt 57 is provided with openings or ports 61 (FIG. 4) throughout its entire length.

A pair of spaced hollow vacuum members or shoes 62 and 63, having orifices 64 and 65, preferably of rectangular cross-section, are mounted on the top 25 of the sorting apparatus, between the shaft 18 and the stud 34. A partial vacuum is established in the vacuum shoes 62 and 63 by exhausting air through an exhaust line 66 by means of a vacuum pump 67. The feed belts 38 and 42 lie next to the vacuum shoes 62 and 63, respectively.

Another hollow vacuum member or shoe 68, having an orifice 69, preferably of rectangular cross-section, is mounted on the top 25 of the sorting apparatus, between the shaft 46 and the stud 53. A partial vacuum is established in the vacuum shoe 68 by exhausting air through an exhaust line 70 by means of a vacuum pump 71, which is shown in FIG. 1 to be driven by a motor 72. The reverse belt 57 lies next to the vacuum shoe 68.

A further hollow vacuum member or shoe 73, having an orifice 74, preferably of rectangular cross-section, is mounted on the top 25 of the sorting apparatus, in front of the shaft 18, and between the vacuum shoes 62 and 63. A partial vacuum is established in the vacuum shoe 73 by exhausting air through an exhaust line 75 by means of the vacuum pump 71.

A check separator guide 76 is positioned between the shaft 18 and the stud 53 at a point where the direction of the feed path for a check is changed by reason of the influence of the vacuum developed at the check separator vacuum shoe 73. Another check guide 77 is located between the stud 28 and the roller 39 adjacent to the feed belts 38 and 42.

A stack of checks or other forms to be sorted is positioned in a check-receiving magazine, which comprises as a bottom surface the top 25 of the sorting apparatus, a front plate 78 mounted adjacent to the pulleys 32 and 33, a side plate 79 mounted adjacent to the pulleys 47, 48, and 49, and a back plate 80 adjustably mounted in a slot 81 provided in the top 25 of the sorting apparatus. The magazine is provided with a mouth portion indicated at 82. The stack of checks may comprise checks of various lengths and widths.

Means may be provided for jogging the stack of checks toward the mouth of the magazine. Such a jogging means may comprise a solenoid, which is connected to operate on a member projecting through an opening in the plate 78, or it may be in the form of a mechanical device, comprising a cam positioned in the opening in the plate and adapted to jog the stack of checks.

As the feed belts 38 and 42 move in a clockwise direction, there is a possibility of withdrawing more than one check from the bottom of the stack of checks in the magazine. To retain all but the lowermost check in the magazine, the continuously ported reverse belt 57 is provided. Normally, the next check is held in contact with the reverse belt 57 in the vicinity of the pulley 47 by the effect of the air being pulled through the openings 61 in the reverse belt. The reverse belt 57 is located along the feed path and spaced from the feed belts 38 and 42, so that single checks may pass between them. If the checks being handled should be quite porous, and if more than one check at a time starts down the feed path, the belt 57 will normally return this surplus check to the magazine, where it will remain until it is entirely withdrawn from the magazine in the next feeding cycle by the action of the vacuum applied through the openings 60 in the feed belts 38 and 42.

There may occur a time when more than one check at a time is withdrawn from the magazine and the vacuum applied through the openings 60 in the feed belts 38 and 42 influences another check to such a degree that the return belt 57 does not function to return such a check to the magazine. The vacuum member 73 is operable in this even to divert the check moving along the initial portion of the feed path under the direct influence of the vacuum applied through the openings 60 in the feed belts 38 and 42 to a succeeding portion of the feed path. The check not directly influenced by the vacuum of the feed belts 38 and 42 will contact the return belt 57 and will be returned to the magazine by the effect of the vacuum applied to it through the vacuum member 68. This last condition may occur when the checks being handled are of an extremely porous nature.

The attractive force applied to a check by means of the vacuum applied through the openings 60 in the feed belts 38 and 42 is greater than the attractive force applied to a check by means of the vacuum applied through the openings 61 in the reverse belt 57, and the attractive force developed by the return belt vacuum is smaller than the attractive force developed by the vacuum of the check separator vacuum member 73. In the specific embodiment of the invention disclosed, the openings 60 in the feed belts 38 and 42 are larger than the openings 61 of the return belt 57. The area of the feed openings 60 is approximately four times the maximum area of the reverse openings 61 that may be associated with a check. Similarly, the area of the orifice 74 of the check separator vacuum member 73 is greater than the maximum area of the reverse openings 61 adjacent to the check separator vacuum member 73. Thus, the feeding of individual checks will be accomplished, even if the amount of the feed belt vacuum is lower than the amount of the reverse belt vacuum. Despite this vacuum differential, the feeding of the checks will be achieved as long as the attractive force applied to a check by way of the openings in the feed belts 38 and 42 is greater than the attractive force applied by way of the openings in the return belt 57.

It is to be noted that, in accordance with another aspect of the invention, the feed belts 38 and 42 are positioned so that they do not overlap the reverse belts 57, 58, and 59. This arrangement assists in preventing excessive wear on the leading edges of the checks by the reverse belt. This arrangement also reduces the normal force between overlapping checks, so that the coefficient of fric-

tion of paper to paper has less influence on the feeding of checks.

What is claimed is:

1. In a machine of the class described, the combination of a magazine for receiving forms of various sizes; a feed belt passing adjacent the magazine and along one side of a feed path for the forms, said feed belt having at least one opening therein; a first hollow vacuum member positioned adjacent said feed belt along said one side of said feed path; means for exhausting air in said first vacuum member, said first vacuum member operable in cooperation with the opening in said feed belt to cause one form at a time to be withdrawn from said magazine and to be moved along said feed path; a reverse belt passing along the other side of said feed path, said reverse belt movable in an opposite direction and having openings therein along its entire length; a second hollow vacuum member positioned adjacent said reverse belt at point along said other side of said feed path near said magazine; and means for exhausting air in said second vacuum member, said second vacuum member operable in cooperation with the openings in said reverse belt to cause the forms to be retained in said magazine except those forms withdrawn one at a time therefrom.

2. In a machine of the class described, the combination of a magazine for receiving forms of various sizes; a feed belt passing adjacent the magazine and along one side of a feed path for the forms, said feed belt having at least one opening therein; a first hollow vacuum member positioned adjacent said feed belt along said one side of said feed path; means for exhausting air in said first vacuum member, said first vacuum member operable in cooperation with the opening in said feed belt to cause normally one form at a time to be withdrawn from said magazine and to be moved along said feed path; a reverse belt passing along the other side of said feed path, said reverse belt movable in an opposite direction and having openings therein along its entire length; a second hollow vacuum member positioned adjacent said reverse belt along said other side of said feed path; and means for exhausting air in said second vacuum member; said second vacuum member operable in cooperation with the openings in said reverse belt to cause any form not directly influence by the vacuum applied through the opening in said feed belt to contact said reverse belt whereupon it is returned to said magazine by said reverse belt.

3. In a machine of the class described, the combination of a magazine for receiving forms of various sizes; a pair of spaced feed belts passing adjacent the magazine and along one side of a feed path for the forms, each of said feed belts having at least one opening therein, with the opening in one feed belt being in alignment with the opening in the other feed belt; a first hollow vacuum member having an orifice positioned adjacent one of said feed belts along said one side of said feed path; a second hollow vacuum member having an orifice positioned adjacent the other of said feed belts along said one side of said feed path; means for exhausting air in said first and second vacuum members, said first and second vacuum members operable in cooperation with the opening in its associated feed belt to cause normally one form at a time to be withdrawn from said magazine and to be moved along said feed path; a reverse belt passing along the other side of said feed path, said reverse belt movable in an opposite direction and having openings therein along its entire length; a third hollow vacuum member having an orifice positioned adjacent said reverse belt along said other side of said feed path; and means for exhausting air in said third vacuum member, said third vacuum member operable in cooperation with the openings in said reverse belt to cause any form not directly influenced by the vacuum applied through the openings in said feed belts to contact said reverse belt whereupon it is returned to said magazine by said reverse belt.

4. In a machine of the class described, the combination of a magazine for receiving forms of various sizes; a pair of spaced feed belts passing adjacent the magazine and along one side of a feed path for the forms, each of said feed belts having at least one opening therein, with the openings in one feed belt being in alignment with the openings in the other feed belt; a first hollow vacuum member having an orifice positioned adjacent one of said feed belts along said one side of said feed path; a second hollow vacuum member having an orifice positioned adjacent the other of said feed belts along said one side of said feed path; means for exhausting air in said first and second vacuum members, said first and second vacuum members operable in cooperation with the opening in its associated feed belt to cause normally one form at a time to be withdrawn from said magazine and to be moved along said feed path; a reverse belt passing along the other side of said feed path, adjacent the area between said feed belts, said reverse belt movable in an opposite direction and having openings therein along its entire length; a third hollow vacuum member having an orifice positioned adjacent said reverse belt along said other side of said feed path; and means for exhausting air in said third vacuum member, said third vacuum member operable in cooperation with the openings in said reverse belt to cause any form not directly influenced by the vacuum applied through the openings in said feed belts to contact said reverse belt whereupon it is returned to said magazine by said reverse belt.

5. In a machine of the class described, the combination of a magazine for receiving forms of various sizes; a feed belt passing adjacent the magazine and along one side of an initial portion of a feed path for the forms, said feed belt having at least one opening therein; a first hollow vacuum member having an orifice positioned adjacent said feed belt along said one side of said initial portion of said feed path; means for exhausting air in said first vacuum member, said first vacuum member operable in cooperation with the opening in said feed belt to cause normally one form at a time to be withdrawn from said magazine and to be moved along said initial portion of said feed path; a second hollow vacuum member having an orifice positioned near said feed belt at a point adjacent said one side of said initial portion of said feed path; means for exhausting air in said second vacuum member, said second vacuum member operable to cause any form being moved along said initial portion of said feed path under the direct influence of the vacuum applied through the openings in said feed belt to be directed to a succeeding portion of said feed path independently of any other form moving along the initial portion of said feed path; a reverse belt passing along the other side of said initial portion of said feed path, said reverse belt movable in an opposite direction and having openings therein along its entire length; a third hollow vacuum member having an orifice positioned adjacent said reverse belt along said other side of said initial portion of said feed path; and means for exhausting air in said third vacuum member, said third vacuum member operable in cooperation with the openings in said reverse belt to cause said other forms to contact said reverse belt whereupon they are returned to said magazine by said reverse belt.

6. In a machine of the class described, the combination of a magazine for receiving forms of various sizes, having a mouth; a pair of spaced feed belts passing adjacent the mouth of said magazine and along one side of a feed path for the forms, each of said feed belts having at least one opening therein, with the openings in one feed belt being in alignment with the openings in the other feed belt; a first hollow vacuum member having an orifice positioned adjacent one of said feed belts along said one side of said feed path; a second hollow vacuum member having an orifice positioned adjacent the other of said feed belts along said one side of said feed path; means for exhausting air in said first and second vacuum members, said first and second vacuum members operable in

cooperation with the opening in their associated feed belt to cause normally one form at a time to be withdrawn from said magazine and to be moved along an initial portion of said feed path; a third hollow vacuum member having an orifice positioned near said feed belts at a point adjacent said one side of said initial portion of said feed path; means for exhausting air in said third vacuum member, said third vacuum member operable to cause any form being moved along the initial portion of said feed path under the direct influence of the vacuum applied through the openings in said feed belts to be directed to a succeeding portion of said feed path independently of any other form moving along the initial portion of said feed path; a reverse belt passing along the other side of said initial portion of said feed path adjacent the area between said feed belts, said reverse belt movable in an opposite direction and having openings therein along its

entire length; a fourth hollow vacuum member having an orifice positioned adjacent said reverse belt along said other side of said initial portion of said feed path; and means for exhausting air in said fourth vacuum member, said fourth vacuum member operable in cooperation with the openings in said reverse belt to cause said other forms to contact said reverse belt whereupon they are returned to said magazine by said reverse belt.

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