

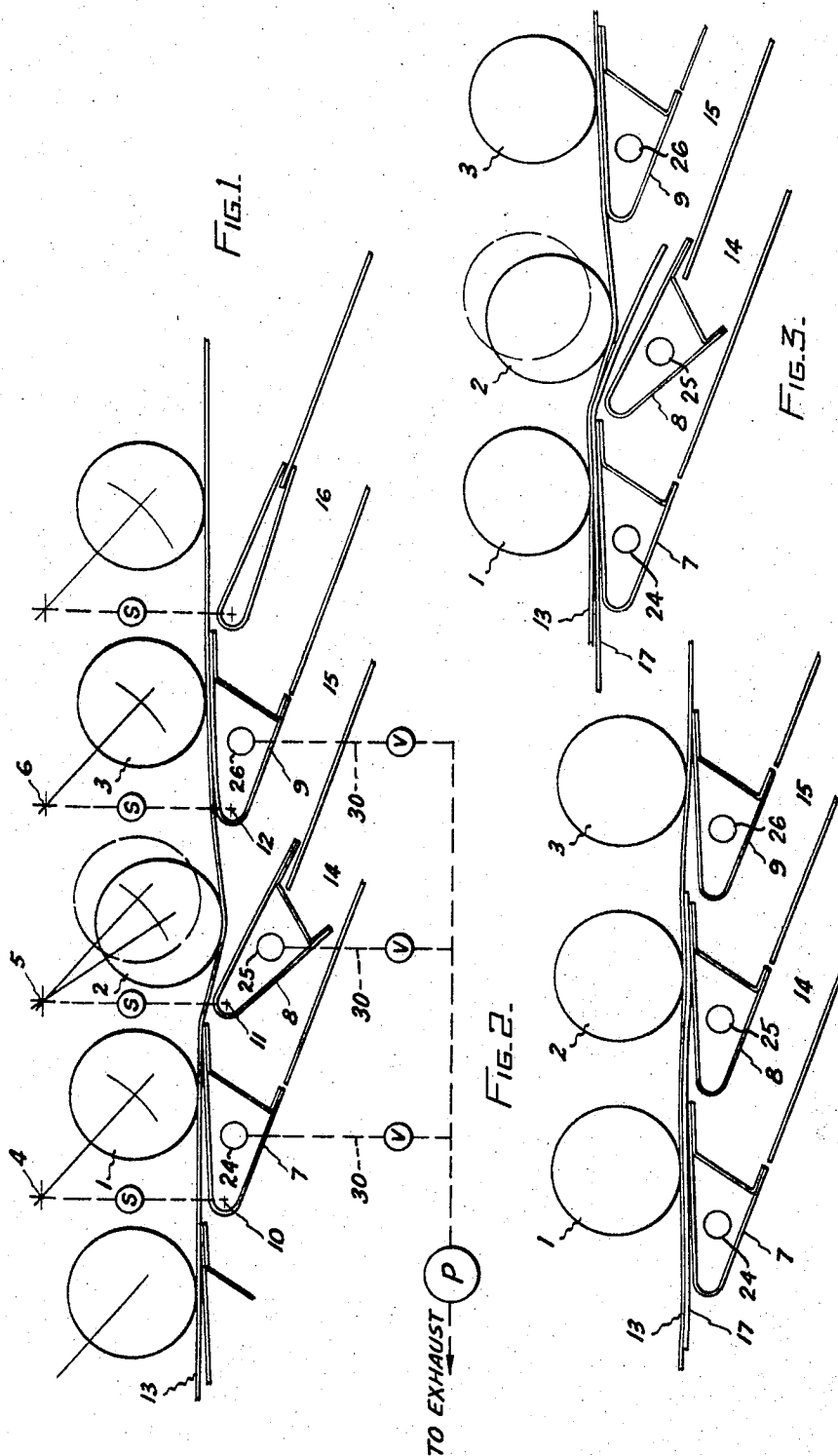
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MAIL SORTING LETTER DIVERTER

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MAIL SORTING LETTER DIVERTER

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ABSTRACT OF THE DISCLOSURE

A sorting diverter for letters or similar flat articles wherein each of a series of adjacent traps coacts with an associated roller and wherein between said traps and rollers a driven belt propels the letters across the inlet sides of all unoperated traps, and when a letter is to be diverted, the appropriate trap opens up its inlet side being tilted inwards, the associated roller simultaneously distorting the belt partly into the open trap so that the letter enters a chute associated with that trap instead of continuing across the inlet sides of succeeding traps.

This invention relates to selective diversion of letters or other flat articles which are to be removed from a main stream in such equipment as is used in mail sorting.

A diverter, according to the invention, forms part of a mail sorting system in which letters, the addresses of which have been read by a sorter, or otherwise sensed, as for example by electronic means, are fed onto some form of conveyor which delivers them in definite sequence to the diverter. Some form of memory device, mechanical or otherwise, will have been set by the sorter or other sensing means aforesaid, so as to deliver an impulse at the appropriate moment for each letter as it reaches the point at which it is to be diverted.

In a particular embodiment of the invention, an electric impulse causes a solenoid to operate the diversion mechanism described hereunder.

It is known to use memory controlled traps of a kind employing a double row of rollers. In one prior system the lower of said rows is so arranged that each alternate roller has superimposed thereon a pivoted platform having a flat upper surface. This platform is adapted to tilt when a letter is urged across it so that it spills the letter downwardly between said surface and the next roller in the downstream direction whenever the roller associated with said pivoted platform is caused to rotate in response to a synchronized signal from the memory. Such a system suffers from the disadvantage that between each of those rollers which is equipped with a platform, an ordinary roller must be provided, and therefore the entire apparatus needs to be approximately twice the length of one in which the traps are adjacent to each other. Furthermore, all the double rollers of such a system must be driven. That is to say, the transporting of the letters takes place by pinching them between those upper and lower rollers which are fitted within the spaces between the platform-bearing rollers.

In the present invention, only one row of rollers is used. These rollers are closely spaced so as to coact with a corresponding set of closely spaced traps. To move the letters, a belt passes between the rollers and the traps and is driven from an external source so that normally it pinches the letters between one of its surfaces and the substantially continuous surface provided by the inlet sides of unoperated traps.

Preferably the traps are V-shaped in cross-section and pivoted at the root of the V. In the normal unoperated

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position, each inlet side of a trap closes its associated chute, while the side remote from the belt, provided primarily for strength, completes the forward wall of the immediately preceding chute. In operation, a trap is moved inwards away from the belt, thus providing an opening into its associated chute. Simultaneously, the associated roller is also moved inwards, thus deflecting the belt and ensuring that letters destined for the opened chute will not be overcarried.

In accordance with the present invention, therefore, a sorting diverter for letters or similar flat articles, comprises a series of adjacent traps each coacting with an associated roller and wherein, between each said trap and roller, a driven belt propels the letters across the inlet sides of all unoperated traps, and wherein, when a letter is to be diverted, the appropriate trap opens by its inlet side being tilted inwards, the associated roller simultaneously distorting the belt partly into the open trap so that the letter enters a chute associated with that trap instead of continuing across to the inlet sides of succeeding traps.

A particular embodiment of the invention will now be described with reference to the accompanying drawing, in which similar references indicate corresponding parts, and in which FIG. 1 shows the last three of a series of traps. It will be seen that rollers 1, 2 and 3 are pivoted at points 4, 5 and 6 respectively. Beneath these rollers are traps 7, 8 and 9, pivoted at points 10, 11 and 12 respectively. Belt 13 runs from left to right between the rollers and the traps, and propels the letters by friction with their upper surfaces. Chutes 14, 15 and 16 lead letters from beneath the traps. Each roller and its associated trap are operated conjointly, for example by means of a solenoid S coupled to the trap pivot points and the roller pivot points as diagrammatically shown in FIG. 1. Those skilled in the art will readily understand the construction of such an arrangement and the connection of the solenoids to a memory device for activating each solenoid at an appropriate time.

Trap 8 and its associated roller 2 are shown operated so that any letter passing between roller 1 and trap 7 will be diverted into chute 15.

FIG. 2 shows the path of a letter 17 between the belt 13 and traps 7 and 8 when none of the rollers 1, 2 or 3 is operated and when none of the traps 7, 8 or 9 is opened. FIG. 3 shows the letter 17 about to enter the chute 15 in response to the opening of the trap 8 and the simultaneous deflection of the belt 13 by the roller 2.

In another particular embodiment of the invention, each said trap is provided with means for reducing the air pressure within the trap. Suitable means for this purpose may comprise ports 24, 25, 26 in the wall of said traps, said ports being connected to conduits 30 (shown diagrammatically in dotted outline) which are in turn, connected to a suitable pump P or the like so that the air pressure in all the traps is reduced, or so that the pressure in any one trap may be reduced on demand by opening its port by valve means V or the like.

In a preferred configuration the driving belt is above the traps, but the invention is equally applicable to a diverter disposed in any plane. Whatever the attitude of the diverter, after a letter has been urged through a trap into a chute it may be moved therealong by gravity or suction or both.

What is claimed is:

1. A sorting diverter for flat articles comprising a plurality of chutes for receiving diverted articles, a pivotal trap for each chute for opening and closing the same, a displaceable roller for each trap in proximity thereto, a single driven belt disposed between the rollers and traps for transporting articles longitudinally with the belt by

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friction between the articles and the belt and closed trap, and means for conjointly operating a trap and its associated roller to open such trap and displace the associated roller against said belt, and partly into the open trap, to cause an article to enter the chute associated with said trap instead of a continuing thereacross.

2. A diverter as claimed in claim 1 wherein said traps have surfaces facing said belt which in the inoperative position of the traps define a substantially continuous surface facing said belt in parallel relation.

3. A sorting diverter as claimed in claim 1, wherein the traps are V-shaped and have pivotably supported apex portions so that the side of each unoperated trap remote from the belt constitutes one wall of the chute of the immediately preceding trap.

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4. A sorting diverter as claimed in claim 3 comprising suction means connected to each trap to reduce the air pressure therein.

5. A sorting diverter as claimed in claim 4, wherein said suction means comprises a source of suction pressure, each trap having a port connected to said source and valve means between said source and said port for opening during the period in which the trap is open.

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