June 7, 1938. A. J. KNIGHT ET AL 2,119,919

CLASSIFYING APPARATUS FOR POSTAL MATTER

Filed April 14, 1936

Fig. 1.

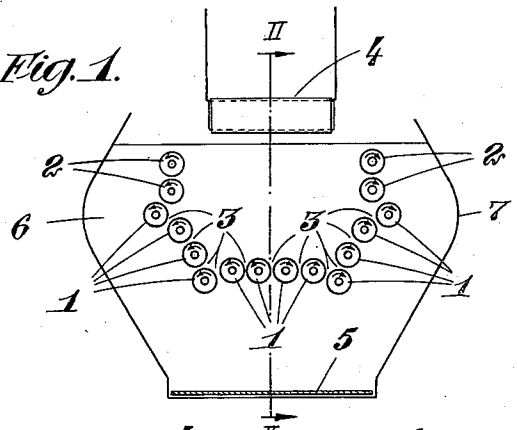


Fig. 2.

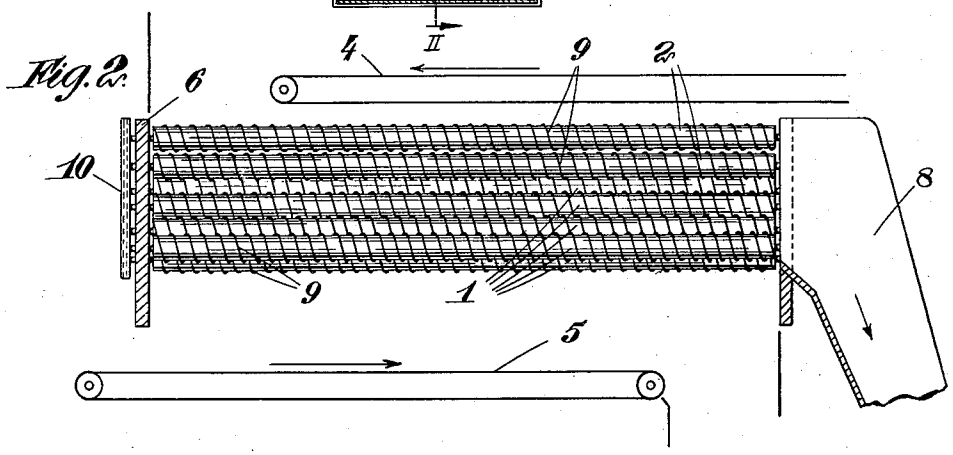
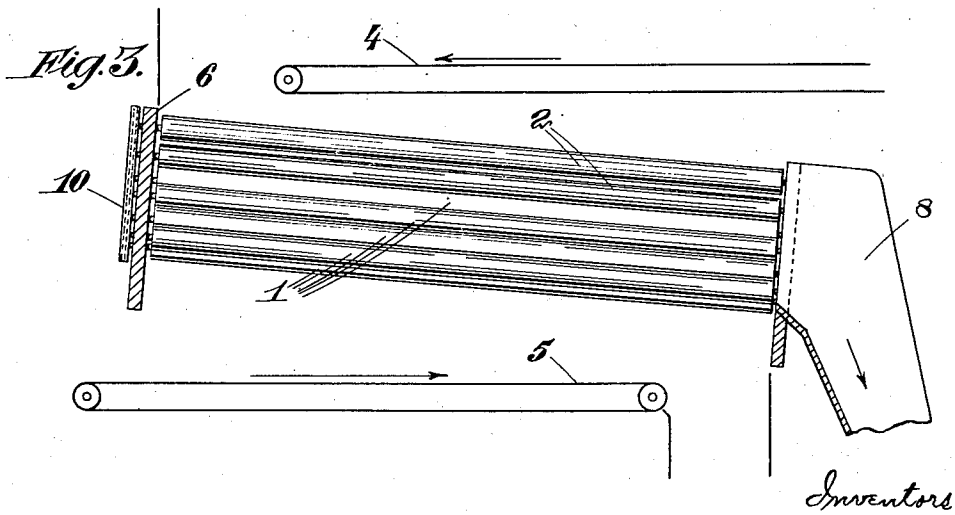


Fig. 3.



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CLASSIFYING APPARATUS FOR POSTAL MATTER

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5 Claims. (Cl. 209—107)

This invention concerns improvements relating to classifying apparatus for segregating letters or letter-like articles (hereinafter termed letters) from parcels, packets or like objects (hereinafter termed parcels) and has for its object to provide a simple but effective apparatus.

According to the invention, such apparatus comprises a plurality of rollers disposed side by side in parallel or substantially parallel relationship with gaps between them large enough to pass the letters but not the parcels and adapted for being rotated in the same direction towards one side or in outward directions from an intermediate line towards the two sides. Postal matter placed in this apparatus is readily separated without damage into its components, the letters falling through the gaps, whilst the parcels remain upon the rollers. Helical formations may be provided upon or applied to the rollers in order to impart to the parcels a longitudinal feed movement which can be utilized for their automatic discharge at one end of the apparatus.

According to a further feature of the invention, the rollers are given a slight slope towards the discharge end of the apparatus for the purpose of imparting the longitudinal feed movement to the parcels. The helical formations may then be dispensed with or a combination of the slope and helical formations may be utilized in order to obtain the desired effect.

Embodiments of the invention by way of example will now be more fully described with reference to the accompanying drawing, in which:—

Fig. 1 is a cross-section of one embodiment,

Fig. 2 a longitudinal section thereof illustrating additional features, and

Fig. 3 a longitudinal section of another embodiment.

In all forms of apparatus according to the invention, the spaced rollers are preferably so disposed that, regarded from one end, they form a trough. As illustrated in Fig. 1, the trough is formed by rollers 1 which are arranged to rotate, at the same speed, outwardly towards the two sides. Additional rollers 2 are provided at the said sides to form overhanging lips to the trough and thus to prevent the postal matter, which tends to be thrown towards the sides, from being projected out of the trough. In some cases, all of the rollers 1 may be arranged to rotate in the same direction. It is then necessary to provide the additional rollers 2 only upon the side towards which the postal matter tends to be thrown by the rollers.

The rollers 1 and 2 are advantageously formed of or faced with a material, for example rubber, which gives them a certain grip on the postal matter so that the latter is thoroughly agitated. In this agitation, the letters relatively quickly enter one or other of the gaps 3 between the rollers 1 and fall through the same, the said gaps being made of such width as to pass a predetermined thickness of letter. Since each gap 3 is bounded by at least one upwardly turning roller-part and since the rollers rotate at the same speed, there is no danger of letters or parcels being mangled between the said rollers. The mixed matter may be brought to the apparatus by a conveyor-band 4 or chute and the separated letters may fall upon a conveyor-band 5 or chute whereby they are conducted to further apparatus. The parcels, on the other hand, remain upon the rollers. This form of apparatus has consequently to be charged with the mixed matter, and relieved of the parcels, in batches. Both ends of the trough are closed by end-plates 6 and the whole is surrounded by a housing 7.

Preferably, however, the apparatus is adapted for continuous charging and continuous discharge of parcels. Two arrangements for this purpose are illustrated in Figs. 2 and 3. In these arrangements, only one end (as illustrated the left-hand end at which the driving means 10 for the rollers is provided) of the trough is closed by a plate 6, whilst the other end opens into a chute 8.

As illustrated in Fig. 2, the rollers 1 and 2 are formed or provided with helical formations 9 designed to impart to the postal matter a longitudinal feed towards the open end of the trough. The latter is made of such length, however, that all of the letters will have been separated, i. e. will have dropped through the gaps 3 before the open end is reached. The parcels, on the other hand, pass out of the apparatus by way of the chute 8 at the said open end and are conducted away wherever required. The helical formations 9 upon the rollers 1 and 2 may be constituted by rubber strip or ribbed facing or by bristles, fibrous material or the like.

As illustrated in Fig. 3, the rollers 1 and 2 are plain and the longitudinal feed movement is provided for by giving the said rollers a slight slope towards the open end of the trough. In other respects, this arrangement may be similar to that just described. A combination of slope and helical formations may be employed, if desired.

It is an important object of the invention to separate the letters as quickly as possible from the parcels and to effect this separation with certainty. For this purpose, it is necessary to provide a variety of paths for the letters, for these will be mixed up with and partly supported by parcels of all shapes and sizes from thick letter-like packages upwards. In normal mixtures of postal matter, a minority only of the letters will find their way to the three gaps in the bottom of the trough. The majority will be

more or less quickly projected against the side-walls of the trough. However, these letters will not all arrive in one direction and in one position and it is important that, as far as possible, they shall not be impeded due to their arrival in directions and positions inappropriate to the positions of the gaps. It is found that much less impedance is offered when the wall-rollers are so arranged as to present gaps at substantial angles to each other, a maximum efficiency being achieved when adjacent gaps are substantially at right angles to each other. The arrangement illustrated in the drawing has two such combinations of gaps at each side wall: At the lower edge of each wall, one roller is set downwardly from the line of the bottom of the trough to form a recess, between the said bottom and wall, from which the gaps open in directions at right angles to each other. In the upper part of each wall, there is a roller set outwardly from the line or general contour of the wall to form a recess from which the gaps open in directions at right angles to each other. At least the next roller above the outwardly set roller is set inwardly to form the lip. As illustrated, lip-rollers above the outwardly set roller form a substantially vertical wall-section, while rollers between the said roller and the bottom of the trough form a steeply inclined wall-section.

Apparatus with rollers of the number, arrangement and relative size illustrated gives an effective result in the case of normal mixed postal matter. It will be understood, however, that a smaller or larger number of rollers and a different disposition thereof may be adopted to suit circumstances. Moreover, the apparatus may be readily modified to form an intermediate separation or separations by increasing the length of the trough and increasing the gap-width between the rollers towards the open end of the trough by employing either slightly splayed or tapered rollers or rollers with one or more stepwise decreases in diameter.

We claim:—

1. Classifying apparatus for segregating letters from parcels, comprising a plurality of substantially parallel rollers disposed with gaps between them in an open trough-formation, including rollers forming the bottom of the trough-formation, a roller set downwardly from the line of the said bottom at a side edge thereof, rollers forming the side walls of the trough formation, a roller set outwardly from the line of a side wall, and at least one roller set inwardly above the last-named roller to form a lip at the top of the side-wall, the downward and outward setting of the rollers respectively so set forming recesses from which the gaps between the said rollers and the respectively adjacent rollers open in directions substantially at right angles to each other.

2. Classifying apparatus for segregating letters from parcels, comprising an open trough-formation having a bottom consisting of a series of parallel rollers with axes in a common plane and a lower parallel roller at each end of the series with its axis in a plane below the axes of the said series of rollers, sides each formed by rollers parallel with and above said lower roller with axes in an outwardly inclined plane, and an outwardly offset parallel roller on an axis slightly above the axis of the uppermost side roller, all adjacent rollers having gaps between them large enough to allow letters to pass but not parcels and being adapted for being rotated so that of the parts of the trough-bottom rollers bounding each gap at least one part is turning inwardly of the trough formation and that the top parts of the trough-side rollers turn outwardly from the trough-formation.

3. Classifying apparatus for segregating letters from parcels, comprising an open trough-formation having a bottom consisting of a series of parallel rollers with axes in a common plane and a lower parallel roller at each end of the series with its axis in a plane below the axes of the said series of rollers, sides each formed by rollers parallel with and above said lower roller with axes in an outwardly inclined plane, an outwardly offset parallel roller on an axis slightly above the axis of the uppermost side roller and an additional roller on an axis above and disposed inwardly of the axis of the offset roller to form a lip on one side at least of the trough-formation, all adjacent rollers having gaps between them large enough to allow letters to pass but not parcels and being adapted for being rotated so that of the parts of the trough-bottom rollers bounding each gap at least one part is turning inwardly of the trough formation and that the top parts of the trough-side rollers turn outwardly from the trough-formation.

4. Classifying apparatus for segregating letters from parcels, comprising an open trough-formation having a bottom consisting of a series of parallel rollers with axes in a common plane and a lower parallel roller at each end of the series of rollers, sides each formed by rollers parallel with and above said lower roller with axes in an outwardly inclined plane, an outwardly offset parallel roller on an axis slightly above the axis of the uppermost side roller and an additional roller on an axis above and disposed inwardly of the axis of the offset roller to form a lip on one side at least of the trough-formation, all adjacent rollers having gaps between them large enough to allow letters to pass but not parcels, means for closing the trough at one end, means for driving the rollers so that the top parts of the side rollers turn outwardly from the trough-formation and at least one part of the bottom rollers bounding each gap turns inwardly of the trough-formation, and means for imparting a longitudinal feed to the parcels away from the closed end of the trough-formation.

5. Classifying apparatus for segregating letters from parcels, comprising a plurality of substantially parallel rollers disposed with gaps between them in an open trough-formation, the rollers constituting a side wall of the said trough-formation being at least five in number and including at least one roller which is displaced from the general contour of the wall to form a recess in the wall from which gaps open in directions substantially at right angles to each other, the rollers above the said displaced roller forming a substantially vertical wall-section whilst the rollers between the said roller and the bottom of the trough-formation form a wall-section inclined relatively to the first-named wall-section and the bottom.

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