

F. G. JAHN.
FEEDING MECHANISM.
APPLICATION FILED AUG. 16, 1905.

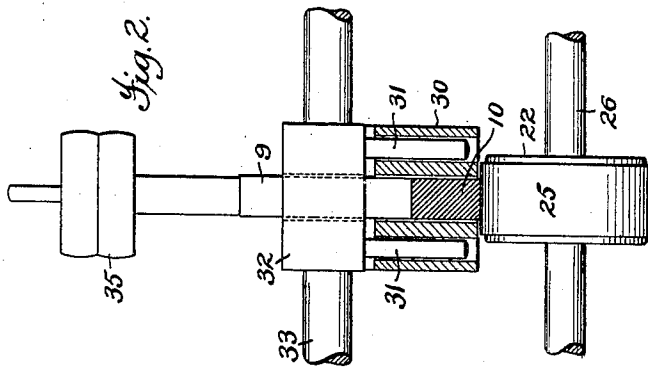


Fig. 2.

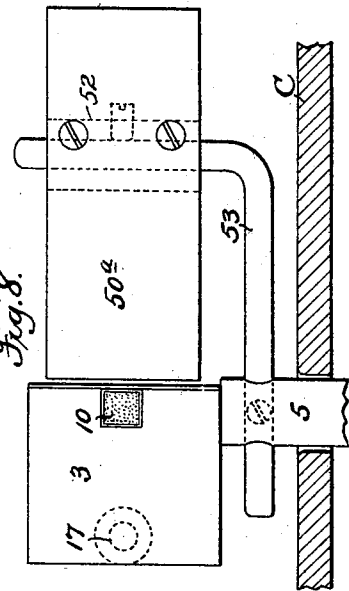


Fig. 8.

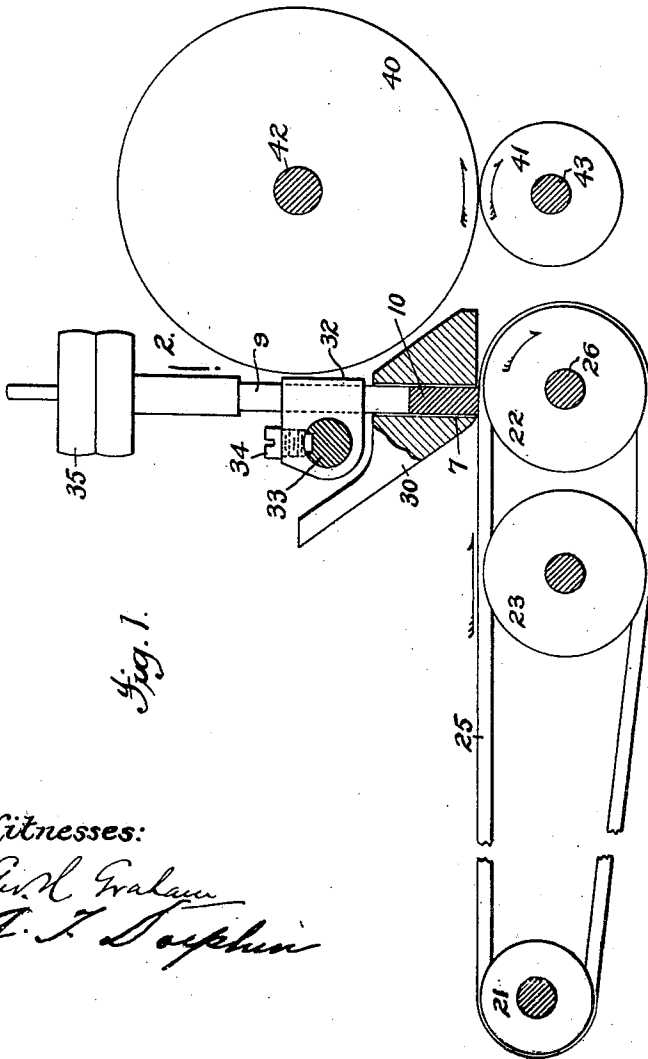


Fig. 1.

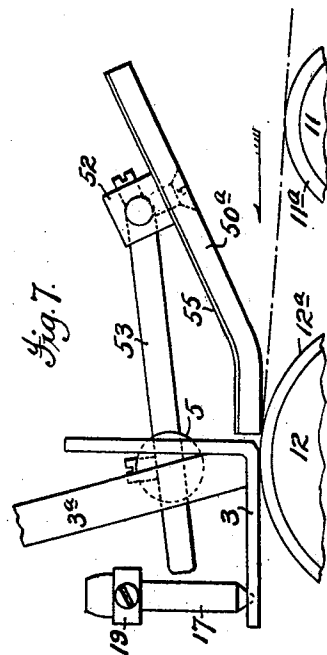


Fig. 7.

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2 SHEETS—SHEET 2.

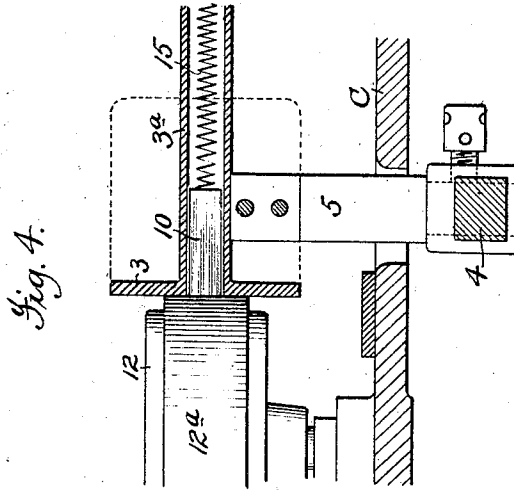


Fig. 4.

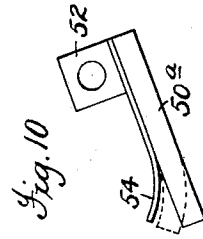


Fig. 10.

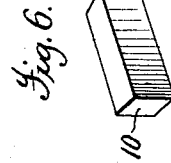


Fig. 6.

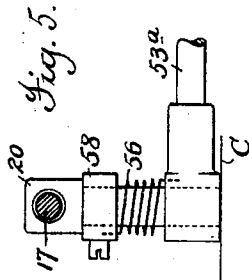


Fig. 5.

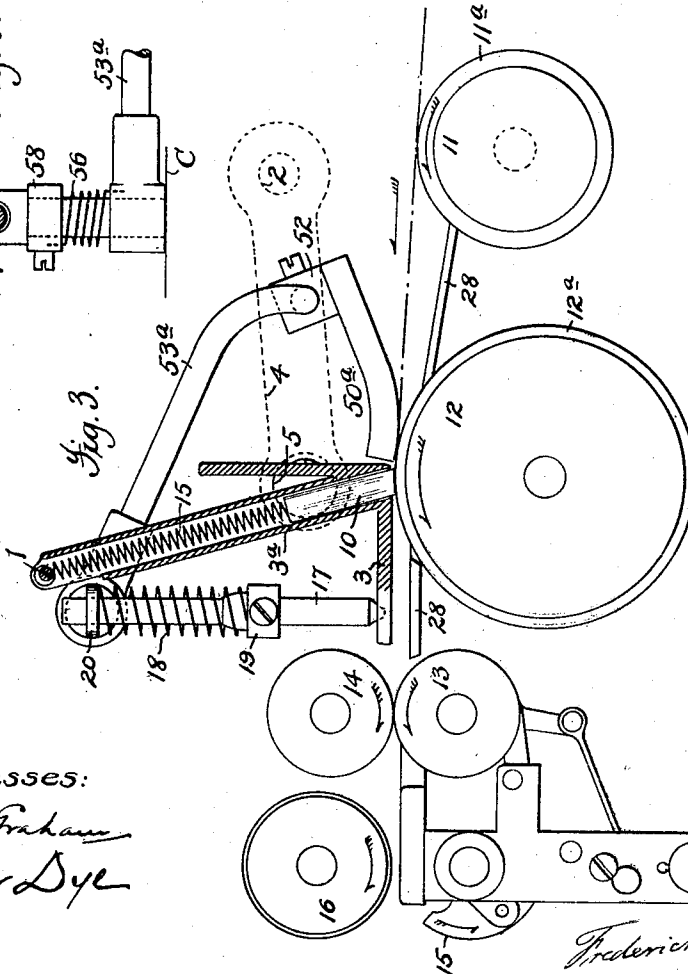


Fig. 3.

Fig. 9.



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UNITED STATES PATENT OFFICE.

FREDERICK G. JAHN, OF NEW YORK, N. Y., ASSIGNOR TO THE INTERNATIONAL POSTAL SUPPLY COMPANY OF NEW YORK, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

FEEDING MECHANISM.

No. 856,346.

Specification of Letters Patent.

Patented June 11, 1907.

Application filed August 16, 1905. Serial No. 274,447.

To all whom it may concern:

Be it known that I, FREDERICK G. JAHN, a citizen of the United States, residing at the borough of Brooklyn, city of New York, and State of New York, have invented certain new and useful Improvements in Feeding Mechanism, of which the following is a specification.

The present invention relates generally to feeding mechanism adapted to the feed of single pieces of paper or other material or mail matter and the like in succession from a pile, stack or bunch thereof.

It has for its object to provide a simple and inexpensive mechanism adapted to efficiently operate on varying sizes, qualities and conditions of non-uniform matter or material that may be promiscuously collected or assembled with as equal accuracy as when operating on uniform material.

It also has for its object to dispense with the necessity of the adjustment heretofore found to be an invariable requirement whenever the character of the matter operated upon changed and whenever inaccuracy of operation appeared due to the wear of the coating parts, the degree of which was never constant but variable as the character of the material varied and the need for which could not be anticipated.

With these main objects in view, the invention consists in the novel structures and combinations of parts hereinafter fully set forth:

The accompanying drawings, which illustrate several practical embodiments of the invention, show in Figure 1, a sectional side elevation of a mechanism designed for the flat or horizontal feed of material or matter to for instance a printing couple; and Fig. 2, a transverse vertical sectional elevation of the same on the line 2, 2, looking rearwardly. Fig. 3, a plan view of a modified form of the mechanism designed for the vertical or upright feed of material or matter as is usual in a well known form of mail or other marking machine. Fig. 4, a cross sectional elevation through the separator container. Fig. 5, an elevation of a portion of said modified construction. Fig. 6, a perspective view of the separator plug or strip

removed from position. Fig. 7, a plan view of yet another modified construction of the improvements, and Fig. 8, a side elevation of the same. Fig. 9, is a diagram illustrating an assemblage of sheets in feeding position; and Fig. 10 is a modified form of the wiper.

The improved feed mechanism is shown with so much of a printing couple and correlated parts as will be needed to a proper understanding of one of the many useful embodiments of the invention; it being understood that the printing couple shown in the drawings is merely representative of a mechanism or device performing some function with respect to the matter fed to or moved through a machine, such as printing, impressing, embossing, counting and the like and wherein it is essential that each individual piece of such matter shall be similarly operated upon, treated or accounted for in its passage through the machine.

The printing couple of Fig. 1, consists of the printing or type carrying roller 40 and its coating impression roller 41, the respective shafts 42, 43 being journaled in a machine frame, not shown, and geared together to run at the same surface speed. In Fig. 3, the printing couple consists of a printing roller or part of a roller 15 with a coating impression roller 16, the axes of which and the cor-related feed rollers 13, 14 being vertically arranged in contradistinction to being horizontally arranged as in Fig. 1. The difference being in the two structures that in the one the sheets or other matter to be operated upon pass through the machine in flat horizontal condition while in the other structure the sheets or other matter stand and pass vertically on edge through the machine as for instance as is common in mail marking machines of the character shown in my United States Letters Patent No. 657,939 dated September 18, 1900, to which the present improvements are readily adapted.

Referring to Figs. 1 and 2 the feeding mechanism consists of one or more horizontally arranged carrying belts or bands 25, stretched around grooved rollers 21, 22 and over an intermediate supporting roller 23,

the carrying belt or belts being arranged to support a pile or stack of pieces of matter horizontally placed thereon to feed or present individual pieces between the members of the printing couple. Coacting with the carrying belt, to insure the feed of single pieces of matter from the stack or pile, is arranged an overlying or angularly opposed separator 10 consisting of a single rectangular plug, block or strip of rubber bearing endwise against the surface of the carrying band 25 and in direct opposition to the feeding function of said band and for better action and more firm support directly opposed to the carrying spindle 26 of the feed roller 22, which may be the driver receiving the power by which the carrying belt or belts are moved and which movement may be either continuous or intermittent all as set forth in a companion application for Letters Patent filed by me August 16th, 1905, Serial No. 274,448 embracing specific claims on this particular form of separator. In this vertical arrangement of the separator plug or strip it is guided and supported on its four vertical sides by the walls of a hole 7 in a container 30, which, in this instance is of sufficient weight to act as a bearer or guide between which and the surface of the carrying belt 25 each piece of matter passes onward through the machine, while the separator strip loose with respect to the container 30 is tending to retard the movement of such piece of matter and actually holds back the succeeding piece or pieces of matter until the rear edge of the first piece has passed beyond the front edge of said strip whereupon such succeeding piece of matter will then be allowed to follow onward between the container and its separator strip and the carrying belt. The weight or pressure of the container or bearer 30 against each individual passing piece of matter is such as to cause the carrying belt to move said piece onward with the same surface speed in opposition to the dragging effect of the separator strip.

The container or bearer 30 is supported in a relatively fixed position by a pair of loosely engaging guide studs 31, see Fig. 2, depending from the under side of a head 32 which is held on a fixed transverse guide rod 33 by a set screw 34 by means of which the bearer and its separator strip may be adjusted to any position transversely of the machine. The connection between the head 32 and bearer 30 is such as to permit a free vertical movement of the bearer with respect to the head to accommodate itself to the thickness of the individual pieces of matter, designed to be acted on and fed successively through the machine.

The separator strip 10 is also free to move with respect to the container or bearer 30 and is caused to exert a desired pressure upon

the passing matter and to thus oppose the passage of more than one piece at a time by one or more weights 35, changeable if desired, acting through a follower 9, upon the end of the strip; the said follower being guided and supported by the walls of a hole in the head 32 and by those of the hole 7 in the bearer 30.

In the modified structures Figs. 3 to 8 wherein the pieces of matter are designed to move through the machine vertically on their lower longitudinal edges, the feed mechanism, represented by a horizontally arranged feed roller 12 with a rubber carrying or feeding surface 12^a, is mounted on a vertical spindle as is an auxiliary feed roller 11, also having a rubber carrying or feeding surface 11^a, while the separator is mounted in a horizontal position directly opposed to the feed roller 12, with the separator plug, block or strip 10 directed endwise horizontally against or toward the feed roller 12 preferably at an angle to a vertical plane taken transversely across the machine. In this instance the rubber (or other proper substance) separator plug 10 is contained by a rectangular guide tube 3^a projecting rearwardly from a bearing plate 3, which extends forwardly in the direction taken by the pieces of matter through the machine to guide them to the feed rollers 13, 14, coacting for this purpose with a portion of a fixed guide 28 arranged on the opposite side of the path of movement of the pieces of matter. In lieu of the weights holding the bearer and separator plug to duty heretofore described the bearer 3 is borne upon by a spring pressed rod 17, and the separator plug 10, by a coiled spring 15, interposed in the container tube between the rear end of the plug and a pin 1; carried at the tube end. The spring 18 of the rod 17 is mounted on said rod between an adjustable collar 19 and the eye of a fixed vertical post 20 rising from the machine table C, see Fig. 5. The bearer 3 and separator container 3^a are carried on the upper end of a post 5, projecting upward through a slot in the table C from a rock arm 4, carried by a pivot 2, see dotted lines, Fig. 3, to permit them to yield bodily with respect to the feed roller 12 against the pressure of the spring 18 to accommodate the passage of different thicknesses of pieces of matter between the roller and bearer. In this instance as in the former embodiment of the invention the bearer and plug may yield independently of each other.

It will be noticed in both of the vertical and horizontal arrangements of the separator plug 10, described, that it occupies only a portion of the widthwise dimensions of the feeding belt or roller, the remaining widthwise portions of the feeding belt and roller on opposite sides of the plug taking the pres-

sure of the bearer 30 as in Fig. 2, and the bearer 3 as in Fig. 4, so that the feed of the belt and roller will be sufficient to overcome the dragging or hold back effect of the separator plug, and substantially no hesitancy in the continuous onward feed of the material occur, the degrees of pressure of the bearer and of the separator plug toward the feed belt and roller being adjusted or determined to insure the proper feeding action of the belt or roller and the separating action of the separator plug.

In dealing with non-uniform matter especially with sheets of paper or the like where the thicknesses of the sheets vary anywhere from one thousandth to several thousandths of an inch, in order to attain absolute accuracy in their separation and feed as individual pieces, it has been found advantageous to employ with the feeding mechanism a flexible ended wiper 50^a, situated, when associated with the separator plug just described, closely in rear of said separator and bearing, or tending to bear against the feed roller or band and against the forward ends of the pieces of matter as they approach the bight between the wiper and feed roller or band, as is indicated in Figs. 3, 7 and 8. The tendency of this wiper is to separate the matter into individual pieces and in doing so to cause the leading edges of the assembled matter to assume a stepped arrangement somewhat in the manner indicated by the diagram, Fig. 9, wherein the innermost piece of matter lying next the surface of the feed roller is the most forward or advanced one, and the most rearward—the outermost one—sufficient surface contact and pressure of the wiper with and against the pieces of matter being provided to cause the assembled pieces to naturally assume this position during the operation of the mechanism so that the separator is relieved of considerable of the work of separation and in consequence the feed of individual pieces is assured.

Several embodiments of the wiper are illustrated in the drawings. In the form shown in Figs. 7 and 8, the wiper 50^a consists of a flat piece of rubber or other flexible and adhesive substance supported at one end by a block 52 adjustably mounted on the turned up end of a rod 53 which is also adjustably carried by the post 5, of the separator. Such a wiper is shown detached in Fig. 10, wherein it is combined with a metal backing 54 bent at its end away from the free and forward end of the wiper so that when in action as indicated by the curved dotted lines there is a slight space between the back of the wiper and its metal backing to allow the wiper to yield very slightly independent of the backing and of its support 52. In lieu of the metal backing the wiper 50^a may be formed with a harder rubber or other backing 55, as indicated in

Fig. 7. Such backing, however, may be of cloth or canvas, or the canvas may be located in the body of the wiper as is common in rubber belting and the like, which prevents the wiper from stretching and yet leaves it sufficiently pliable for the purpose. Many ways of supporting the wiper will suggest themselves to those skilled in the art. As indicated in Fig. 5, the supporting rod 53^a of the wiper is hinged to the post 20, a spring 56 (see Fig. 5) being coiled around the post one end engaging the hinged or pivoted rod 53^a and the other engaged by an adjustable collar 58 on the post, for varying the tension of the spring, and thus provide a yielding support for the wiper in addition to the inherent flexibility of the material of the wiper.

The extent of bearing surface of the wiper against the feeding device, such as the roller 12 or belt 25 will depend largely upon the character of the matter being fed through the machine as well also, as the degree of pressure against the feeding device. It is advantageous to mount the wiper and bearer 3 or 30 so that they will yield independently of each other during the passage of the matter being fed, and furthermore that when the bearer is employed with the wiper that the free end of the wiper shall be as close the entrance to the bearer and opposed feeding device as will allow freedom of movement of both. So too the entrance end or corner of the bearer 3 as in Figs. 3 and 7, should be slightly flared or rounded.

The general function and operation of the improved wiper operating with or without the separator plug will have been understood from the foregoing description. In the organization shown in Figs. 1 and 2, the bunch of matter to be fed will be placed on the carrying band 25 immediately in rear of the bearer 30. On forward motion being imparted to the band the lowermost piece will be carried onward under the bearer and the strip 10 to the printing couple while the remaining pieces of the bunch will be held back thereby. In Figs. 3 and 7 the assembled matter to be fed through the machine is placed at the entrance of the machine so as to come within the action of the feed roller or rollers 12, 11, which take the individual piece in contact therewith and feed it forward against the dragging action of the wiper which is at the same time holding the other pieces of matter back and preventing their feed until the rear edge of the properly fed piece has passed beyond the forward edge of the wiper whereupon the next piece of matter is fed forward under the wiper and so on. Where still further perfection in separation is requisite, the leading edge of the matter having passed the wiper may pass between the bearer and the roller and encounter the separator plug 10 which in addi-

tion to guarding against the feed of more than one piece at a time exerts sufficient pressure against the passing piece of matter, to aid the roller or belt in more positively carrying it forward than the mere pressure of the bearer 3 or 30 would do. The use of the feed roller 11 in the structure shown in Fig. 3, is not absolutely essential. It is useful where the assembled matter is of different lengths and where the leading edges were not originally even with one another, in which case it acts to feed a backward piece up into feeding position on the roller 12 before a more forward piece can be taken and fed forward by said roller 12. In other cases it may supplement the feed action of the roller 12.

No claim is herein made to the specific form of gravitating or weighted separator and gravitating or weighted bearer illustrated in Figs. 1 and 2, as the same forms the subject of another application hereinbefore referred to.

What is claimed is:

1. The combination with a feed mechanism, of an opposed flexible ended strip of adhesive material fixed relatively to the feed movement and arranged with its end flexed or bent in bearing against the forwardly moving surface of the feed mechanism, and a support for said strip permitting a bodily yielding movement of the strip with respect to said feed mechanism.
2. The combination with a feed mechanism, of an opposed separator strip of abrasive material fixed relatively to the feed movement, and a support therefor forming a bearer against the feed mechanism in addition to the strip and adapted to permit a yielding movement of the strip.
3. The combination with a feed mechanism, of an opposed separator strip and bearer both mounted in surface alinement and fixed relatively to the feed movement and each adapted to independently yield with respect to the feed mechanism.
4. The combination with a feed mechanism of an opposed bearer mounted relatively fixed with respect to the feed movement, and a separator strip of flexible material confined in position within the compass of the bearer with their active surfaces in alinement and said strip adapted to yield independent of said bearer.
5. The combination with a feeding device, of a coating flexible ended wiper of adhesive material its said end flexed or bent in bearing against the moving surface of the feeding device and extending away from said device in a direction at an angle to the feed movement.
6. The combination with a forwardly rotating feed roller, of a coating flexible wiper

of adhesive material flexed or bent in bearing against said roller and extending away therefrom at an angle to the feed movement, and a support for said wiper connected thereto at a point removed from its forward bearing end.

7. The combination of a feed device, a flexible wiper coating therewith and a bearer impinging against the feed device in advance of the wiper.

8. The combination of a feed device, a wiper coating therewith, a bearer and a separator strip each impinging against said device.

9. The combination of a feed device, a coating wiper of adhesive material flexed or bent in bearing against said feed device and extending in an inclined direction to the feed movement, and a laterally yielding support for the wiper.

10. The combination of a continuously rotating feed roller, a coating wiper of adhesive material flexed or bent in bearing against said feed roller, and a laterally yielding support for the wiper.

11. The combination of a continuously rotating feed roller, a coating flexible ended wiper of adhesive material flexed or bent in bearing against said feed roller, and a spring pressed support for the wiper.

12. The combination of a feed device, a laterally yielding wiper and a laterally yielding bearer in advance of the wiper and both impinging against the feed device.

13. The combination of a feed device, a laterally yielding wiper, a laterally yielding bearer and a strip or plug supported by the bearer.

14. The combination of a feed roller, and an opposed flexible wiper adapted to impinge on the surface of the roller and be thereby flexed or bent and fixed relative to the surface travel of said roller to prevent the feed of more than one piece at a time.

15. The combination of a feed roller, an opposed flexible wiper adapted to impinge on the surface of the roller and be thereby flexed or bent and fixed relative to the surface travel of said roller to prevent the feed of more than one piece at a time, and a supplemental feed roller for advancing the pieces of matter toward the wiper and the first named feed roller.

16. The combination of a feed roller, a flexible wiper and a bearer each adapted to impinge against the surface of said roller in advance of the articles being fed.

17. The combination of a feed roller, a spring pressed bearer and a spring pressed flexible wiper each adapted to impinge against the surface of the roller in advance of the articles being fed.

18. The combination of a feed roller, a spring pressed bearer and a spring pressed

strip or plug guided by the bearer and both adapted to impinge against the surface of the roller.

19. The combination of a feed roller, a yielding wiper, a spring pressed bearer mounted in advance of the wiper, and a yielding strip or plug guided by the bearer, the wiper, bearer and strip each adapted to bear against said roller.

20. The combination of a feed roller, a wiper, a bearer and a strip or plug each mounted to yield independently of the others.

21. The combination of a feeding device, a wiper and a bearer in advance of the wiper, the bearer having a flared entrance.

22. The combination of a feeding device, a

wiper, a bearer in advance of the wiper and a resistance piece mounted in propinquity to the bearer.

23. The combination of a feeding device, a wiper, a bearer mounted immediately in advance of the wiper, both forming a substantially continuous bearer against the feeding device and adapted to yield independently of one another.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 31st day of July, 1905.

FREDERICK G. JAHN.

Witnesses:

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A. T. DOLPHIN.