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D. S. BAIRD

MAGAZINE WRAPPING MACHINE

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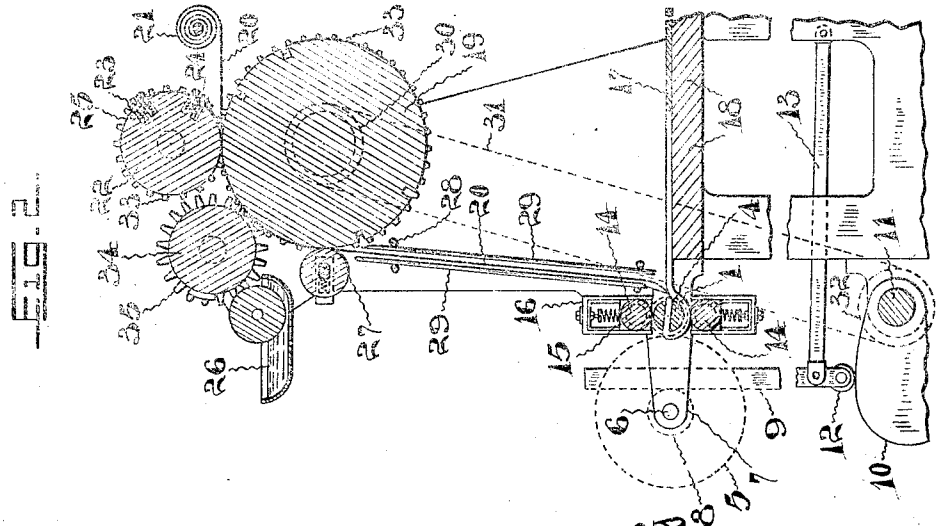


Fig. 2.

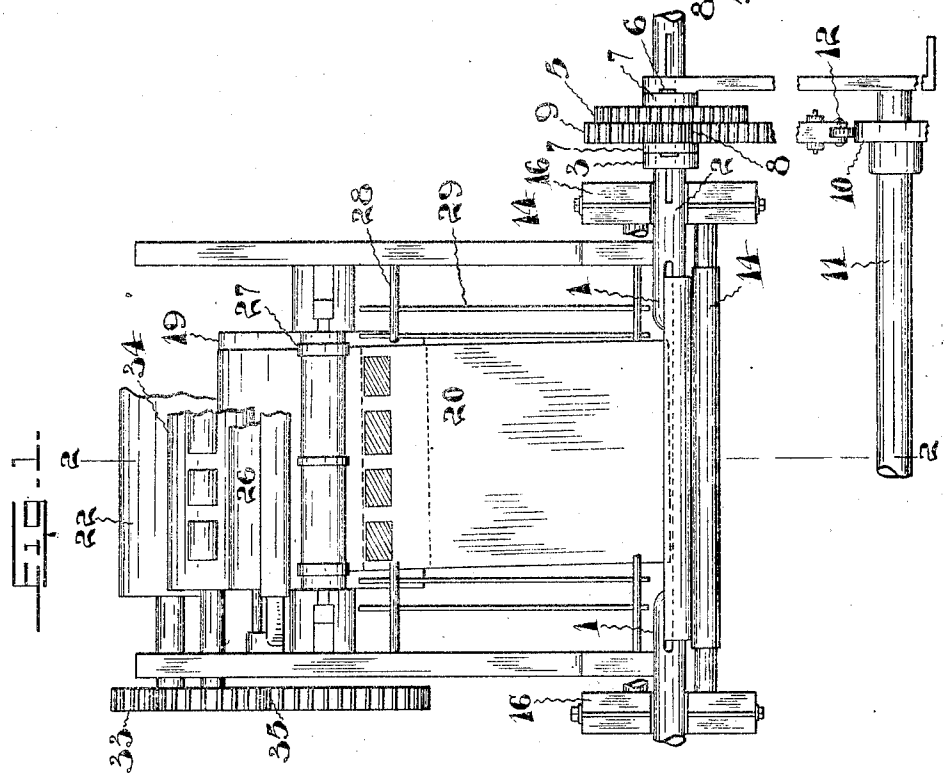


Fig. 1.

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MAGAZINE-WRAPPING MACHINE.

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To all whom it may concern:

Be it known that I, DANIEL S. BAIRD, of the city of Hamilton, in the county of Wentworth, Province of Ontario, Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Magazine-Wrapping Machines, of which the following is a specification.

This invention relates to magazine wrapping machines of the type employing rotatable forks which grasp the magazine near the forward edges of its ends and roll it up with a sheet of paper having a gummed edge by means of which it is sealed.

In such machines it is known to feed the paper as a web and to sever the sheets therefrom, but it is found that there is a great deal of trouble experienced in keeping the paper straight during its passage from the supply roll to the wrapping mechanism, and if the paper does not run straight it will not roll straight about the magazine. It is my object therefore to devise means for ensuring the wrapper being so rolled in and about the magazine that plies overlie one another as nearly as possible with their edges in alinement and the end of the wrapper parallel to the axis about which the magazine and wrapper were rolled.

I attain my object by means of the constructions hereinafter fully described and illustrated in the drawings, and which may be briefly described as follows.

The web of paper from the supply roll is led between a bed roll and a feed roll and in its passage over the bed roll is acted on by a rotary cutter associated with the feed roll which produces two lines of weakness across the web, one more pronounced than the other, and thereafter by a gumming roll which applies gum adjacent the rear end of each partly severed sheet into which the web is divided.

After passing the gumming roller the web passes between two constant speed rollers, one of which is yieldingly pressed towards the other, which other is preferably the bed roll hereinbefore referred to. Thence the web is led between guides which confine it sufficiently to guide its end to a magizine, as the latter is being rotated by the forks, but without binding it in any way.

The feed of the web is continuous and uniform, but the surface speed of the rotating magazine is designed to be greater than that of the travelling web from which it results that a sheet is torn from the end of the web along the adjacent line of greatest weakness as soon as its end is firmly grasped in the magazine.

If the web is travelling straight, the end is gripped firmly from side to side as soon as it enters the fold of the magazine. If, however, the web is not travelling quite straight after passing the feed roll and cutter, its forward edge is not parallel to the axis of the rotating magazine, and one corner is more advanced than the other. In this case, the forward corner is first grasped and pulled until the forward feed of the paper is sufficient to cause the front edge to be gripped for its full width. The result is that the paper receives a preliminary pull at the side adjacent the leading corner, which causes the tearing off of the sheet to begin at that side and to progress across to the other side. This action tends to straighten the web back of the spring pressed roll between which and the feed roll the action of the gumming roller tends to upset the alinement of the paper.

It does not appear that the straightening movement is very great in any one operation, but I do find that when a free and unconfined end is torn from a constantly travelling web along a line of weakness that the operation causes the web to run straight, whereas much difficulty is experienced in causing separate sheets to run straight.

The invention is illustrated in the accompanying drawings in which

Fig. 1 is a front elevation of part of a magazine wrapping machine provided with my improvements; and

Fig. 2 a section on the line 2—2 in Fig. 1.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

The wrapping mechanism proper has as its basis the forks 1 formed on the spindles 2 rotatably and longitudinally slidable in the bearings 3. The forks are rotated through the medium of the pinions 4 engaging the spindles 2 through the medium of suitable keys and keyways. The pinions mesh with gear wheels 5 fast on the spindle 6 journalled in the brackets 7. These spindles also carry the pinions 8, which mesh with racks 9. These racks are driven by means of the cams 10 fast on the shaft 11, the lower ends of the racks being preferably provided with the anti-friction rollers

12. The racks are held in place at their lower ends by the links 13, said links being pivotally connected at their forward ends with the frame of the machine. The upper ends of the racks slide in the brackets 7. By the constructions just described the forks 1 are given a rotary movement in one direction, the movement being then reversed and the forks returned to their original position. The forks are also, as already described, capable of endwise movement. This movement is imparted to them at the proper time by any mechanism known in the art.

To ensure a tight roll and to ensure also the proper pasting of the pasted edge of the wrapper in contact with the roll, I provide the pressure bars 14, preferably formed as rolls journalled in the blocks 15 movable to and from the forks in the guides 16. The pressure bars thus maintain a firm pressure on the roll as the wrapping proceeds, while they readily yield to accommodate themselves to the increasing diameter of the roll as wrapping proceeds.

The magazines to be wrapped may be fed forward to the forks 1 by any known means. I show for this purpose a feeding slide 17 suitably supported on the table 18 and which may be operated in any known manner.

My invention lies particularly in the parts I will now describe for preparing and feeding the wrapping paper to be rolled in with the magazine through the medium of the forks 1.

Above the parts previously described is suitably journalled a large roll 19, which may be termed a bed roll. Over this roll the web of paper 20 is led from the supply roll 21. Journalled adjacent the bed roll is the rotary feed roll and cutter 22, which carries two knives 23 and 24 which are adapted to co-operate with the bed roll to produce lines of weakness in or partly sever the web, either by producing lines of perforations, deep scorings, or in any other suitable manner. The cutters will be so arranged that one of the lines of weakness is more pronounced than the other so that the web will more readily tear thereon.

The cutter knives are mounted between stripper bars adapted to slide radially in the rotary cutter and which are yieldingly held pressed outwardly by coil springs 25. The more pronounced lines of weakness delimit the separate wrapping sheets and along these lines the web is torn in the process of wrapping as hereinafter described. The other lines of weakness facilitate the breaking open of the wrapper by the recipient of the rolled magazine.

After passing between the bed roll and the rotary feed roll and cutter, a gummed edge is formed adjacent one edge of each sheet delimited in the web through the medium of the gumming mechanism 26, which is of ordinary type and driven in synchronism with the bed roll and cutter through gearing hereinafter described.

From the gumming mechanism the web passes between the spring pressed roller 27 and the bed roll 19, the spring pressed roller serving to hold the paper down so that it is not readily lifted away from the bed roll by the action of the gumming mechanism and to feed it towards the wrapping mechanism hereinbefore described.

It is at this point, however, that the alinement of the web of paper is liable to be disturbed as the gumming roller seems to have a tendency to pull one side or the other of the paper away from the bed roll due to the stretchability of the paper.

Between the wrapping mechanism and the said two rollers is located the guide 28. This may be of any form which will guide the web so that its end may be caught in the magazine as it is rolled up, but is shown as composed of two wire grids 29 between which the web loosely passes. The web is thus capable of moving more or less both laterally and in a direction to or from the rollers within certain limits.

The bed roll 19 is driven from the driving mechanism for the forks in such a manner that the web of paper is fed forward at a speed which is constant relative to the speed of rotation of the forks 1 during the wrapping movement. The speed of the paper feeding mechanism is preferably such that the rate of feed of the web is somewhat less than the speed at which the magazine rotated by the forks tends to draw in the wrapping paper. The result of this is that as soon as the end of the web is firmly grasped in the magazine, the end sheet is torn from the web, the result of this action being as hereinbefore described.

The spring pressed roller 27 is of great importance in securing the desired result as the paper, when pulled, will slide under the roll, and the pull on the paper thus made effective right back to the feed roll to straighten out and flatten the paper.

I show the bed roll as being connected with a sprocket wheel 30 driven by a sprocket chain 31 from a sprocket wheel 32 on the shaft 11. The rotary feed roll and cutter 22 is preferably half the diameter of the bed roll and is therefore driven at twice the speed through the medium of gearing 33 from the bed roll. The gumming roll 34 of the gumming mechanism 26, being half the diameter of the feed roll, is also driven at twice the speed of the feed roll through the medium of gearing 35. The spring pressed roller 27 is an idler roll. Thus the wrapping sheets are delimited by lines of weakness, are provided with the extra line of weakness to facilitate the tearing open of the rolled magazine, and are gummed adjacent one

edge during one revolution of the bed roll.

What I claim is:—

1. In a magazine wrapping machine, the combination of feed mechanism adapted to draw a web of paper from a roll; means geared with the feed mechanism and located intermediate of the supply roll and the point of delivery of the feed mechanism for producing spaced lines of weakness across the web delimiting individual wrappers; rotary magazine rolling mechanism adapted to grasp and rotate a magazine fed to it; means loosely guiding said web to direct its leading end to a position to be rolled in with the magazine whereby the paper is free to move laterally between the feed mechanism and the wrapping mechanism; and means for synchronously driving said feed mechanism and magazine rolling mechanism so proportioned that the latter tends, when the web is caught in a magazine, to draw the web in at a greater speed than that at which it is fed whereby the wrapper delimited by a line of weakness is torn from the web.

2. In a magazine wrapping machine constructed as set forth in claim 1, a specific construction in which the feed mechanism comprises two rollers yieldingly held together and having their delivery point spaced from the wrapping mechanism a distance somewhat greater than the length of an individual wrapper.

3. A magazine wrapping machine constructed as set forth in claim 1 provided with gumming mechanism located between the means for producing lines of weakness and the point of delivery of the feed mechanism.

4. In a magazine wrapping machine, the combination of a supply roll for a web of paper; a bed roll; a rotary cutter geared to and co-operating with said bed roll to produce spaced lines of weakness across the web delimiting individual wrappers; gumming mechanism geared to and co-operating with said bed roll to gum the wrappers; a spring pressed feed roll co-operating with said bed roll to feed the web; rotary magazine rolling mechanism adapted to grasp and rotate a magazine fed to it; means loosely guiding said web to direct its leading end to a position to be rolled in with the magazine whereby the paper is free to move laterally between the feed mechanism and the wrapping mechanism; and means for synchronously driving said fed roll and magazine rolling mechanism so proportioned that the latter tends, when the web is caught in a magazine, to draw the web in at a greater speed than that at which it is fed whereby the wrapper delimited by a line of weakness is torn from the web.

5. In a magazine wrapping machine constructed as set forth in claim 4 a specific construction in which the bed roll and spring pressed roll are so located relative to the wrapping mechanism that their delivery point is spaced from the wrapping mechanism a distance somewhat greater than the length of an individual wrapper.

6. In a magazine wrapping machine constructed as set forth in claim 4 a specific construction in which the gumming mechanism is located between the rotary cutter and the spring pressed roll and in which the bed roll and spring pressed roll are so located relative to the wrapping mechanism that their delivery point is spaced from the wrapping mechanism a distance somewhat greater than the length of an individual wrapper.

7. A magazine wrapping machine constructed as set forth in claim 1 provided with means for producing lines of weakness across the web adjacent the other lines of weakness and of less pronounced character whereby the web tends to tear along the latter rather than the former.

Signed at Hamilton, Canada.

DANIEL S. BAIRD.