June 11, 1940. J. W. LEARY 2,204,369

CIGARETTE TIPPING DEVICE

Filed April 6, 1935 2 Sheets-Sheet 1

FIG. 1

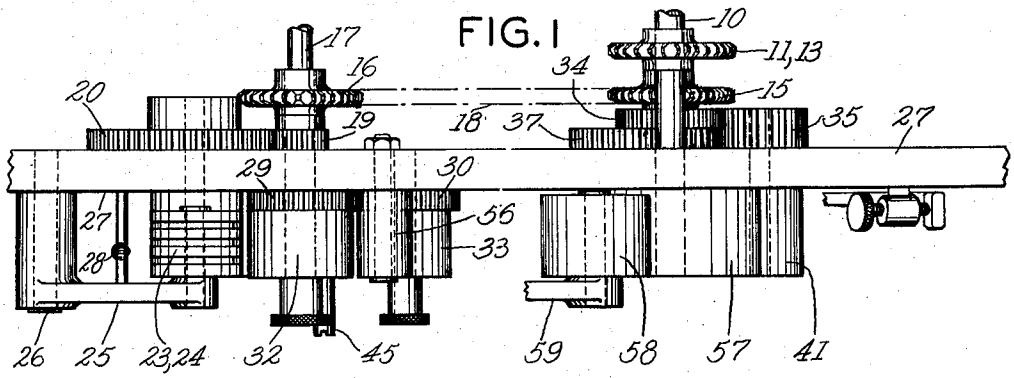
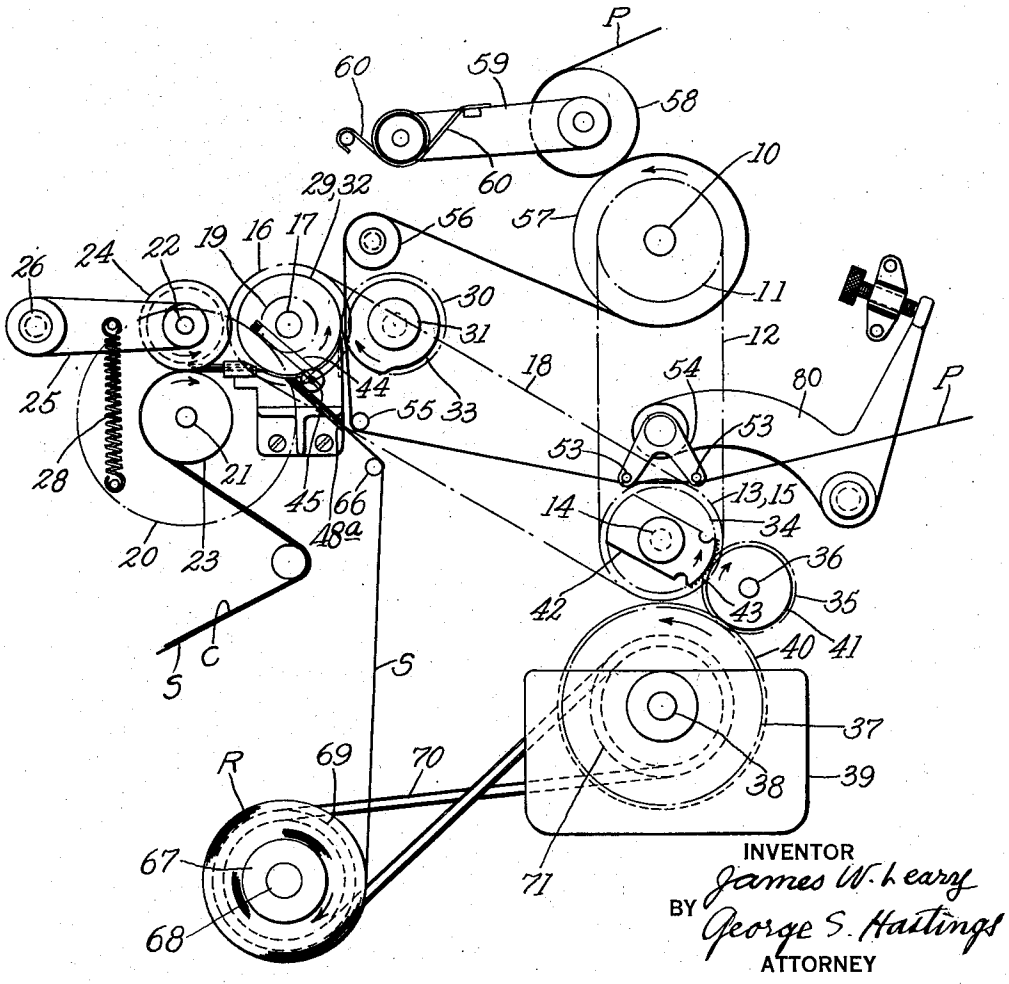


FIG. 2



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CIGARETTE TIPPING DEVICE

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FIG. 3

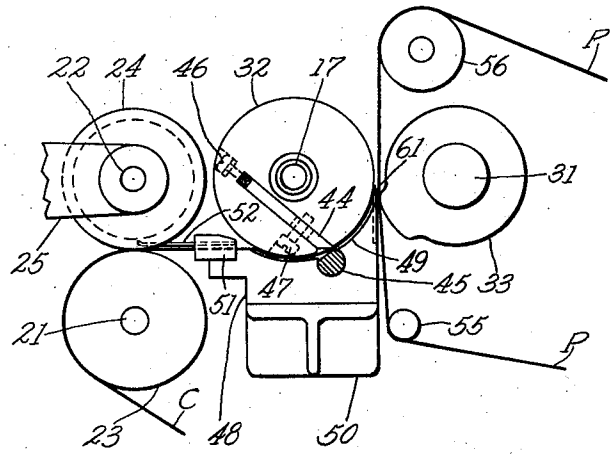


FIG. 4

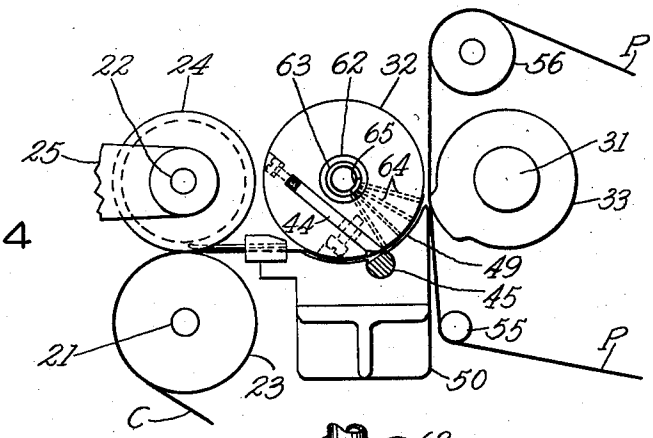
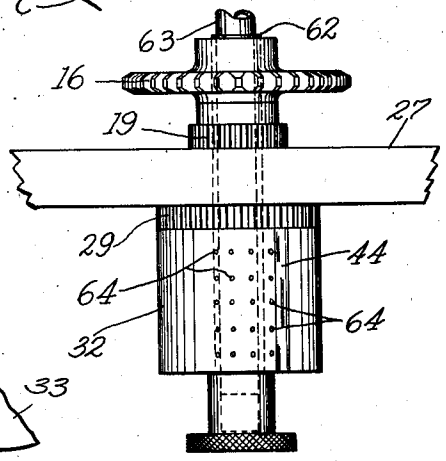


FIG. 5



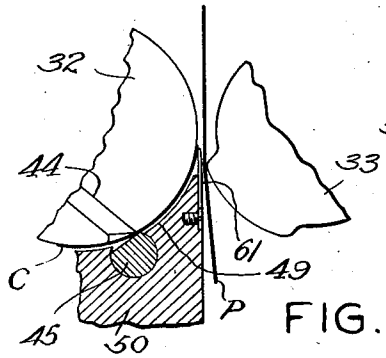


FIG. 6

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UNITED STATES PATENT OFFICE

2,204,369

CIGARETTE TIPPING DEVICE

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Application April 6, 1935, Serial No. 14,994

17 Claims. (Cl. 154—36)

This invention relates to improvements in tipping mechanisms to be used in conjunction with continuous rod cigarette machines or in wrapper banders, its main object being to produce a device suitable for operation at high speed with a continuous feed of the wrapping and tipping material.

To this end the web of cork, ivory, gold leaf, or other suitable tipping material is fed from a reel by two coacting feed rollers and is cut across a stationary ledger plate by a knife supported in a revolving drum or roll. The cut portion, the length of which is sufficient to provide cork, ivory or gold tips for two cigarettes, is transported by the cutting edge of the knife, without interrupting its movement, to a position where it is clamped between the drum and the raised segment of a roll around which passes the wrapper web to be tipped; and the severed length is thereby fed lengthwise on to a pasted section of the continuous wrapper web and pressed thereon.

The same object may be attained with a modified form of drum whereon the severed lengths are suctionally retained, said drum being provided with suction port holes in front of the knife which pick up the severed length and transport it to the traveling web of wrapping material.

Another object is to remove the backing strip which is usually applied to fragile tipping materials such as ivory and gold leaf, and rewind the same. This is accomplished by first manually tearing the leading end of the strip loose from the tipping material and then attaching the strip to a revolving core so that the strip will be separated from the tipping material before the latter is cut, and rewound on the core.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts;

Fig. 1 is a plan view of the improved tipper;

Fig. 2 is a side elevation of the same;

Fig. 3 is a detail view on an enlarged scale showing the arrangement of the knife drum and ledger plate;

Fig. 4 is a similar view of a modified form of knife drum;

Fig. 5 is a plan view of the same; and Fig. 6 is a detail view on an enlarged scale of the mounting of the leaf spring in the construction shown in Figs. 1–3.

In carrying the invention into effect there is provided mechanism for advancing from a roll a web of tipping material having a backing strip, means for separating the backing strip from the web of tipping material, mechanism for continuously advancing a web of wrapping material, a device for applying paste at predetermined intervals to the traveling web of wrapping material, cutting mechanism operating to sever lengths from the traveling web of stripped tipping material and advance them into register with the pasted sections of the web of wrapping material, and means for pressing the registered lengths into adhering relation with the pasted sections of the wrapping material. In the best constructions contemplated the cutting mechanism includes a stationary block having a concave face, a ledger plate set into the face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between the drum and face being slightly greater than the thickness of the tipping material, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on the ledger plate from the web of tipping material in the gap and advance them along said face. The pressing means in the best constructions, includes a rotating roll provided with a raised segment and adapted to press the pasted section of the web of wrapping material against the severed length on the drum while the same is being advanced by the knife.

These various means and parts may be widely varied in construction within the scope of the claims for the particular device selected to illustrate the invention is but one of many possible concrete embodiments of the same. The invention, therefore, is not to be restricted to the specific construction shown and described.

Referring to the drawings, a shaft **10** drives a sprocket **11** which by means of a chain **12** drives a sprocket **13** mounted on a shaft **14**. The shaft **14** also carries a sprocket **15** driving a sprocket **16**, mounted on shaft **17**, by means of a chain **18**. On shaft **17** is mounted a pinion **19** meshing with a gear wheel **20** fastened on shaft **21**. The shaft **21** and a stud **22** carry feed rollers **23** and **24**, respectively, coacting to feed the tipping material C. The roller **24** is carried by an arm **25** pivotally mounted on a stud **26** carried by the frame **27**, a tension spring **28** connected to a post in the arm **25** providing means for holding the roller **24** in engagement with

roller 23. The shaft 17 carries a gear wheel 29 meshing with a gear wheel 30 loosely mounted on a stud 31. A knife drum or roll 32 is fast to the shaft 17 and a segment roller 33 is fastened to the gear-wheel 30 and free to revolve on the stud 31.

On shaft 14 is mounted a spur gear 34 meshing with an intermediate gear 35 mounted on a shaft 36, said gear 35 meshing with a gear-wheel 37 fastened on a shaft 38 supported in bearings of a paste receptacle 39. A paste wheel 40 also fastened on shaft 38, in revolving, picks up paste stored in the receptacle and transfers the same to a distributing roller 41. To shaft 14 is fastened a segmental paster 42 having a knurled face 43 which at each revolution engages the roller 41, thereby picking up a quantity of paste which is applied at proper intervals to the traveling web of wrapping material.

The roll 32 is provided with a chordal slot which receives a knife 44 (Fig. 3) adapted to cut the proper length of tipping material from the continuous web C across a ledger plate 45. The ledger plate 45 is adjustably mounted, as will be presently described, to permit setting the same in proper position to oppose the cutting edge of the knife. By means of a screw 46 the knife 44 can be advanced or retracted with respect to the ledger plate 45 until the desired position of its cutting edge is obtained; and when properly set, the knife is locked in position by a set screw 47.

The ledger plate 45, which may have a half-round form, is supported with one edge of its flat face disposed to meet the cutting edge of the knife, by a block 48 having a concave face 49 which partly surrounds the drum 32. A transverse groove is provided in the face 49, and the ledger plate is disposed in said groove and screwed into the block 48. Block 48 is attached to a bracket 50 fastened to frame 27, and the gap between the roll 32 and the face 49 is slightly greater than the thickness of the tipping material. Plate 51 has a plurality of resilient prongs 52 extending into circumferential grooves provided in roller 24 and thereby guiding the tipping web under the plate 51 and into said gap.

The web of wrapping material P is unwound from a roll (not shown) and is tensioned as it passes under studs 53 (Fig. 2) supported in an arm 54, and is drawn around a guide roll 55. The wrapping material is then led upwardly between the drum 32 and segmental roll 33 and around rollers 56, 57, and 58. The roller 58 is mounted on an arm 59 and is yieldingly pressed against the roller 57 by means of a spring 60 to compensate for the increased thickness of the tipped sections of the wrapper web.

The revolving paster 42 contacts the section of the traveling web P spanning the studs 53 and thereby applies paste thereto at the proper intervals. Studs 53 are set in the legs of a V-shaped frame carried by an adjustable arm as shown in Fig. 2. This mounting of the rollers 57, 58 and the studs 53 and the construction of the paster 42 is shown in my Patent 2,167,119, issued July 25, 1939.

The web C fed by rollers 23 and 24 passes through the guide 51 and encounters the revolving drum 32 which produces an ironing effect on the web C while guiding the same over the concave face 49. The rollers 23 and 24 thus advance the web C over the ledger plate 45 to a point where the leading end of the tipping material enters under a leaf spring 61 (Fig. 3) carried by block 48, which presses the tipping material against the drum 32 and thereby prevents the same from buckling or from springing away when the rotating knife 44 severs the desired length therefrom across the ledger plate 45. The severed length is transported by the cutting edge of knife 44 until and while it is clamped against the web of wrapping material between the drum 32 and the raised segment of roller 33. In being clamped and advanced by said segment and drum, the severed length is pressed into adhering relation upon the paste spot previously applied to the wrapping material.

Referring now to Figs. 4 and 5, a modified principle for transporting the severed length is disclosed. In this arrangement the roll 32 is fastened to a sleeve 62 free to revolve on a stationary suction conduit 63 connected to a suitable source of suction (not shown). The roll 32 and sleeve 62 are provided with port holes 64 in front of the knife 44 and arranged to periodically register with a perforation 65 in the tube 63, whereby the severed length will be suctionally retained on the roll 32 and thus transported to the pasted section of the wrapping material.

The web C, as in the above-described embodiment of the invention, is likewise fed over the ledger plate 45, whereupon the leading port holes 64 register with the perforation 65 of the suction conduit 63 and pick up the leading edge of the web C. In turning, the remaining port holes of the roll 32 move into register with the said perforation 65, and thereupon pick up a length of the web C sufficient for the cork tips of two cigarettes. The web C is thus held while the required length of tipping material is cut by knife 44, and the severed length is advanced by the drum 32 until the web of wrapping material is pressed thereagainst by the segmental roll 33. In this position, the severed length of tipping material is progressively pressed into adhering relation with the paste spot previously applied on the wrapping material, the suction being progressively shut off as the port holes 64 move past the perforation 65 of the suction conduit 63.

In some cases, when a web of relatively fragile material such as ivory or gold leaf is used for the tipping material, it is reinforced with a paper backing strip which must be removed before the severed lengths of ivory or gold leaf are applied to the wrapping material. This is accomplished by providing a slot 48a in the block 48 and bracket 50 (Fig. 2) through which the leading end of the backing strip S is manually threaded after being separated manually from the web of tipping material, thus permitting the backing strip S to be led through said slot and over a guide roll 66, the tipping material being advanced in the same manner as heretofore described. The end of the paper S is fastened to a core 67 loosely mounted on a stud 68, the core 67 being fastened to a pulley 69 also mounted on stud 68 and driven by means of a belt 70 running over a driving pulley 71 mounted on a shaft 38 driven from the main drive of the cigarette machine.

In case the backing strip need not be rewound, it may be drawn through the slot in the block 48 and bracket 50 by coacting continuously rotating feed rolls (not shown).

It should be noted that the provision of means for suctionally picking up the web of tipping material on the roll 32 and retaining the severed length thereon to transport it to the pasted section of wrapping material, is of great advantage with exceedingly thin materials like gold

leaf. When either using or dispensing with the suction principle on the roll **32**, however, the peripheral speed thereof is equal to that of the traveling wrapping material to permit the severed tip to be applied to the web of wrapping material while being continuously advanced at a constant speed.

In the operation of the device the web of wrapping material P is drawn over the studs **53** of the frame **54** as it is unwound from the roll, and the paste wheel **40** picks up paste from the paste pot **39** and transfers the same to the distributing roller **41** which, in turn, delivers the paste to the segmental paste applicator **42**. The latter applies paste to the traveling wrapper web P at the required intervals, at a section where the web P spans the studs **53**. The frame **54** is pivotally supported on one end of an arm **80**, and an adjusting screw bearing against the other end of the arm **80** provides means for raising or lowering the studs **53**, to permit the traveling wrapper web P to be set so that the paste applicator **42** presses lightly against the same. Furthermore, the frame **54** may be swung in either direction on its pivot to best suit the applicator; and having been located for the best results, the frame **54** is locked in position on its pivot by a nut (not shown).

It should also be noted that the wrapper web is thus held in pasting position by tension, and if the wrapper web is broken or exhausted no paste will be deposited on the wrapper web or the studs **53** or other parts of the tipper. During the advancing movement of the wrapper web the pasted sections thereof are drawn past the tip-severing mechanism, whereby the severed tips are pressed on to said pasted sections and pressed into adhering relation therewith.

With the preferred embodiment of the invention, the severed tip is transported to the wrapping material by the knife itself, but when using the suction principle to pick up the tipping web and retain the severed tip on the roll **32** it is necessary to permit the roll **32** to slip over the tipping web, due to the much slower rate at which the feed rollers **22** and **23** are advancing the tipping material. For this purpose a very light suction is provided on the roll **32** to cause the same to slip on the tipping material after picking it up, until the length of material required for the tip is severed therefrom.

What is claimed is:

1. In a tipper, the combination with mechanism for continuously advancing from a roll a web of tipping material having a backing strip, of means for separating the backing strip from the web of tipping material, mechanism for continuously advancing a web of wrapping material, a device for applying paste at predetermined intervals to the traveling web of wrapping material, cutting mechanism operating to sever lengths from the traveling web of stripped tipping material and advance them into register with the pasted sections of the web of wrapping material, and means for pressing the registered lengths into adhering relation with the pasted sections of the wrapping material, said cutting mechanism including a stationary block having a concave face, a ledger plate set into said face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between said drum and face being slightly greater than the thickness of the tipping material, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on said ledger plate from the web of tipping material in said gap and advance them along said face, and a suction conduit on which said drum revolves, said conduit having a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred to the pasted section of the web of wrapping material.

2. In a tipper, the combination with mechanism for continuously advancing from a roll a web of tipping material having a backing strip, of means for separating the backing strip from the web of tipping material, mechanism for continuously advancing a web of wrapping material, a device for applying paste at predetermined intervals to the traveling web of wrapping material, cutting mechanism operating to sever lengths from the traveling web of stripped tipping material and advance them into register with the pasted sections of the web of wrapping material, and means for pressing the registered lengths into adhering relation with the pasted sections of the wrapping material, said cutting mechanism including a stationary block having a concave face, a ledger plate set into said face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between said drum and face being slightly greater than the thickness of the tipping material, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on said ledger plate from the web of tipping material in said gap and advance them along said face, and a suction conduit on which said drum revolves, said conduit having a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred to the pasted section of the web of wrapping material, and said pressing means including a rotating roll provided with a raised segment adapted to press the pasted section of the wrapping material against the severed length on the drum while the port holes are moving out of register with the perforation of the conduit.

3. In a tipper, the combination with mechanism for continuously advancing from a roll a web of tipping material having a backing strip, of means for separating the backing strip from the web of tipping material and rewinding the strip, mechanism for continuously advancing a web of wrapping material, a device for applying paste at predetermined intervals to the traveling web of wrapping material, cutting mechanism operating to sever lengths from the traveling web of stripped tipping material and advance them into register with the pasted sections of the web of wrapping material, and means for pressing the registered lengths into adhering relation with the pasted sections of the wrapping material, said cutting mechanism including a revolving drum having a peripheral speed equaling the linear speed of the wrapping material, a knife fastened in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths from the web of tipping material, and a suction conduit on which said drum revolves, said conduit having a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed

length on the drum while it is being transferred to the pasted section of the web of wrapping material.

4. In a tipper, the combination with mechanism for continuously advancing from a roll a web of tipping material having a backing strip, of means for separating the backing strip from the web of tipping material and rewinding the strip, mechanism for continuously advancing a web of wrapping material, a device for applying paste at predetermined intervals to the traveling web of wrapping material, cutting mechanism operating to sever lengths from the traveling web of stripped tipping material and advance them into register with the pasted sections of the web of wrapping material, and means for pressing the registered lengths into adhering relation with the pasted sections of the wrapping material, said cutting mechanism including a revolving drum, a knife fastened in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths from the web of tipping material and advance them along said face, and a suction conduit on which said drum revolves, said conduit having a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred to the pasted section of the web of wrapping material, and said pressing means including a rotating roll provided with a raised segment adapted to press the pasted section of the wrapping material against the severed length on the drum while the port holes are moving out of register with the perforation of the conduit.

5. The combination with cutting mechanism operating to sever lengths from a continuously traveling web of tipping material and advance them into register with the pasted sections of a wrapper web, of means for pressing the registered lengths into adhering relation with the pasted sections of the wrapper web, said cutting mechanism including a stationary block having a concave face, a ledger plate set into said face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between said drum and face being slightly greater than the thickness of the tipping material, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on said ledger plate from the web of tipping material in said gap and advance them along said face, and a suction conduit on which said drum revolves, said conduit being provided with a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred to the pasted section of the wrapper web.

6. The combination with cutting mechanism operating to sever lengths from a continuously traveling web of tipping material and advance them into register with the pasted sections of a wrapper web, of means for pressing the registered lengths into adhering relation with the pasted sections of the wrapper web, said cutting mechanism including a stationary block having a concave face, a ledger plate set into said face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between said drum and face being slightly greater than the thickness of the tipping material, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on said ledger plate from the web of tipping material in said gap and advance them along said face, and a suction conduit on which said drum revolves, said conduit being provided with a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred to the pasted section of the wrapper web, and said pressing means including a rotating roll provided with a raised segment adapted to press the pasted section of the web against the severed length on the drum while the port holes are moving out of register with the perforation of the conduit.

7. The combination with mechanism for continuously advancing a web of tipping material, of cutting mechanism operating to sever lengths from the traveling web and advance them into predetermined position, said web-cutting mechanism comprising a stationary block having an arcuate face, a ledger plate set into said face, a revolving drum disposed adjacent said face and provided with a chordal slot, the gap between said drum and face being slightly greater than the thickness of the web, a knife fastened in the slot in said drum with its cutting edge projecting sufficiently from the periphery of the drum to sever lengths on said ledger plate from the web of tipping material in said gap, and a suction conduit on which said drum revolves, said conduit being provided with a perforation and said drum being provided with port holes in front of said knife to register with said perforation in order to suctionally retain the severed length on the drum while it is being transferred.

8. In a tipper, the combination with mechanism for continuously advancing a web of wrapping material, of a device for applying paste at predetermined intervals to the traveling wrapping material, a drum contiguous said wrapping material and continuously revolving at a peripheral speed equal to the linear speed of the wrapping material and provided with suction port holes terminating in its periphery to pick up and suctionally retain a web of tipping material thereon, mechanism for severing a tip from the web of tipping material while it is suctionally retained on the drum, and means for cutting off the suction in said port holes, when the tip retained thereon has been brought into register with a pasted section of the wrapping material to progressively release the tip and permit it to be pressed into adhering relation with the pasted section of the wrapping material.

9. In a tipper, the combination with mechanism for continuously advancing a web of wrapping material, of a device for applying paste at predetermined intervals to the traveling wrapping material, a drum contiguous said wrapping material and continuously revolving at a peripheral speed equal to the linear speed of the wrapping material and provided with suction port holes terminating in its periphery to suctionally retain a web of tipping material thereon, mechanism for severing a tip from the web of tipping material while it is suctionally retained on the drum, and means for cutting off the suction in said port holes when the tip retained thereon has been brought into register with a pasted section of the wrapping material to progressively release the tip and permit it to be pressed into adhering relation with the pasted section of the wrapping material.

10. In a tipper, the combination with mecha-

nism for continuously advancing a web of wrapping material at a constant speed, of a drum contiguous said wrapping material and continuously revolving at a peripheral speed equal to the linear speed of the wrapping material, means for suctionally retaining a web of tipping material on the periphery of said drum, and mechanism for severing a tip from the web of tipping material while it is retained on the drum, whereby the severed tip will be retained on said drum and pressed against said wrapping material while being advanced at a linear speed equal to that of the wrapping material.

11. In a tipper, the combination with mechanism for continuously advancing a web of wrapping material, of a roll contiguous said wrapping material and continuously revolving at a peripheral speed equal to the linear speed of the wrapping material, means for advancing a web of tipping material past said roll at a linear speed substantially less than that of the wrapping material, mechanism for severing a tip from the web of tipping material and means on said roll for holding the severed tip on the periphery of said roll and thus carrying it into contact with and then pressing it against the wrapping material while advancing it at a linear speed equal to that of the wrapping material.

12. In a tipper, the combination with a revolving drum, of means for suctionally retaining a web of tipping material on said drum, a stationary ledger plate extending along said drum, and a knife carried by said drum and disposed to sever the web of tipping material on said ledger plate while the web is suctionally retained on the drum.

13. In a tipper, the combination with mechanism for continuously advancing a web of cigarette paper, of mechanism for continuously advancing tip material at a speed slower than that of the cigarette paper, means for cutting tips from said tip material, and a continuously rotating suction drum having a peripheral speed greater than the speed of advancing movement of the tip material arranged to carry the cut tip from cutting position into contact with said paper.

14. In a tipper, the combination with mechanism for continuously advancing a web of cigarette paper, of a roll contiguous said cigarette paper, means for continuously rotating said roll at a peripheral speed equal to the linear speed of the cigarette paper, means for continuously advancing a web of tip material on to said roll at a linear speed substantially less than that of the cigarette paper, a stationary member having a curved face adjacent said roll and concentric therewith for guiding the web of tip material on to said roll, mechanism for severing a strip from the web of tip material, a member for pressing the severed strip against the periphery of said roll, and a member for pressing the cigarette paper against the severed strip so pressed against the roll.

15. In a tipper, the combination with a roll, of means for continuously rotating said roll, means for guiding and continuously advancing a web of tipping material on to said roll, mechanism for severing a strip from the portion of the web of tipping material guided on to said roll, and a fixed member for pressing the leading end of the web of tipping material against said roll prior to severance of the strip therefrom.

16. In a tipper, the combination with a continuously revolving roll, of means for continuously advancing a web of tipping material on to said roll, means for guiding the advancing tip material on to the roll, mechanism for severing a strip from the tipping material, and a flexible member for pressing the web of tipping material against said roll prior to severance of the strip therefrom.

17. In a tipper, the combination with mechanism for continuously advancing a web of wrapping material, of a roll contiguous said wrapping material and continuously revolving at a peripheral speed equal to the linear speed of the wrapping material, means for advancing a web of tipping material to said roll at a linear speed substantially less than that of the wrapping material, mechanism for severing a strip from the tipping material, means on said roll for holding the severed strip on the periphery of said roll and thus carrying it into contact with the wrapping material while advancing it at the speed of the latter, and a rotary member arranged to press the wrapping material against the strip held on said roll.

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