This invention relates to machines for stemming and handling tobacco leaves, and more particularly to a device for stemming leaves. The invention consists of improvements with respect to a machine of the type disclosed in U. S. Patent No. 1,981,470, issued November 20, 1936, to Rupert E. Rundell and Gustaf A. Haquist.

While the machine of the above mentioned patent has proven eminently satisfactory in stemming tobacco, it has been found that certain types of leaves are more perfectly stemmed than others. This is probably due to the type of tobacco inasmuch as it varies to a very considerable degree. Leaves intended for filler tobacco have stronger and heavier web portions than do leaves used in cigarette making in which the web is thin and tender while the stem thereof is relatively heavy, and far heavier per given leaf than that of a similar leaf of filler tobacco.

Accordingly, it is an object of this invention to provide a device which will more efficiently stem leaves which have relatively tender web portions. To do this there is provided means which will effectively support the leaves during the stemming operations.

It has also been found that on many occasions leaves being stemmed had too much stem left therein due to the snapping off or breaking of the stem too far down from the tip of the leaf. Another disadvantage was caused by the bending back of the tips of leaves during the feeding operation wherein the leaf would be bent back upon itself, would be deflected away from the leaf feeding drum, the leaf would either be torn or improperly stemmed and might be ejected from the machine with the stem. It is therefore a further object to provide means which will allow the removal of more stem than herefore possible. It is an additional object to provide a device which will prevent tearing, buckling and doubling back of the leaf upon itself, or providing means which will give additional support to the leaves and positively hold and direct the web portions of leaves away from the stem being removed from the leaves.

Also, in stemming leaves which for some reason have not been fully opened during movement to the stemming devices, the web portions thereof may be badly damaged when the stems are removed therefrom. Accordingly, it is an added object of this invention to provide such support for the webs that the zone of tear will be localized and be held to a minimum.

In prior machines the presence of gum and other materials issuing from the leaves has necessitated the use of special means for effecting their removal from the stripping device. By the use of the improved stripper of this invention these substances are removed by the stripper itself during its operation through cooperation with the stem gripping means. Furthermore, this member also furnishes means for cleaning the grippers of scrap tobacco and waste while they are stemming leaves.

It is therefore, an additional object of this invention to provide a member which will prevent the accumulation of gum or like products upon its operative surfaces, and also prevent accumulation of scrap and waste materials in the grippers which form a part of and convey stems through and out of the stemming mechanism.

With these and other objects not specifically set forth in view, the invention consists of certain constructions and combinations which will be hereinafter fully described and then particularly pointed out 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 partial side elevation of the machine showing the operation of the stem removing members:

Fig. 1A is a detail view of Fig. 1; and

Fig. 2 is a view looking upward toward the structure illustrated in Fig. 1, and showing on a larger scale, partly in section, the stem being removed from the leaf.

Referring to the drawings, the belts 10 and 11, which are of the type of feed belt shown in the above noted patent, run over pulleys mounted on shafts 12 and 13 taking the leaves from a belt, not shown, between them and guiding them to a suction cylinder 14. The periphery of cylinder 14 is provided with suction ports 15 permitting the suction to suck and hold the leaf to said cylinder. The stemming unit consists of the aforesaid cylinder 14, a stem gripping drum 16, and a stripper device which as shown in the present disclosure is a roller 17 provided with a plurality of spaced flanges or similar members which may be formed integrally thereon or built up on a shaft.

The leaf L delivered by the belts 10 and 11 on to the surface of cylinder 14, is by the rotation of the cylinder carried past the opposite revolving drum 18 which is spaced from the cylinder a distance sufficient to allow the leaf and the desired amount of tip stem to go through and
the tip of the leaf to enter between the drum 15 and the flange roller 17. The leaf being thus advanced, in a manner similar to that described in the above mentioned patent, the drum 15 and the flange roller 17 are in contact with the leaf portion which will hereinafter be described, into engagement with the stem S. The leading gripper nips the stem at approximately the point where the drum and cylinder are closest where there will be little or no danger of removal of that part of the stem in cross wires, desired to be left in the stemmed leaves. The opposite movement of the drum and cylinder causes the stem thus gripped to snap or break and be torn from the web. Each succeeding gripper when moved into stem engaging position grips other parts of the stem and upon this being gripped, the stem S is taken by drum 16 and thereby carried to one side of the roller 17 while the leaf portion L, held by suction on cylinder 14, passes on the other side. The stem S, in being pulled by the grippers, passes over the small diameter 17a of roller 17, and the leaf portion which is being pulled by the cylinder 14 also passes over this diameter, but the portion of the leaf held to the cylinder, guides the center leaf portion, that is, the part which is near the stem over the large diameter 17b of the roller. In this manner, the movement of roller 17 in the opposite direction with respect to the direction of pull of the stem and leaf, the roller tears, peels or strips the leaf from the stem. By this arrangement the roller produces an improved stripping action resulting in perfectly clean stems with practically no waste of leaf. Furthermore, because of the flanges 17b the possibility of the leaf portions of the leaves being badly torn, or following the stem, or the doubling back of the tips thereof is substantially avoided because some of the flanges act to position the webs positively against the suction drum while others are straddling the stem which is being removed from the leaf. In stemming fully opened leaves the flanges limit the tearing of the web to a zone close to the stem but when leaves which are partly folded are being stemmed this tear limiting feature is especially valuable inasmuch as the tendency to tear is greater due to the fact that in some cases it is necessary to tear the stem out right through the web. Obviously with this construction excessive damage to the web is prevented. Also, because it is possible to locate the flanged roller closely between the drum and the grippers, the length of “snap” or amount of stem remaining in the tip of each leaf is cut to a minimum, and more of the stem can be removed from each leaf. The stem S continues to be striped by being pulled over roller 17 while the leaf L is carried around cylinder 14 from which it is discharged upon a delivery belt 18. A suitable valve, not shown, provided in the interior of cylinder 14 shuts off the suction when the leaf is discharged. The gripper unit consists of stationary members 20, Fig. 2, which are suitably attached to the drum 16 and cam actuated members 21 which slide in longitudinal runways 22 provided in drum 16. Members 21 are equipped with rollers 23 engaging a stationary cam 24 which opens and closes the grippers. The members 21 support blocks 25 which receive one end of a compression spring 26, its other end resting against an adjustable plug 27, in this manner the rollers 23 being normally held in contact with the cam. When the jaws 20—21 grip a stem, the compression of spring 26 tends to hold the member 21 in closed position.

The cam 24 is so designed that the gripper jaws are opened when nearing the stem receiving grooves G (Fig. 1), which are a plurality of 24 (Figs. 1 and 1A) which protrude into the grippers and discharge the stripped stems S.

As shown in the present embodiment, member 17 is fixedly mounted for rotation on pin 18 and below cylinder 14 and drum 15. Referring to Fig. 2, it will be noted that the faces of each flange are generally conical in shape, and are adapted to closely fit between the non-grasping or rear walls of the grippers. By this coaction the relative movement between the flanges and the gripper drum causes a scraping which effects the removal of any gummy or like materials that ooze from the leaves and would be likely to accumulate on the surfaces of these members, as well as any scrap that may fall from the leaf as they pass the grippers.

It will be understood that various changes in the details of construction and arrangement can be made within the scope of the invention as set forth in the appended claims. The invention is not, therefore, to be limited to the particular embodiment shown and described herein.

What is claimed is:

1. In a stemming machine, a traveling member provided with a plurality of relatively movable opposed gripping elements, a traveling member provided with means for holding leaves, means for feeding leaves to said members, means for moving said members oppositely for removing the stems from said leaves, means cooperating with said members for simultaneously cleaning said gripping elements and holding the stems on said members for conveying trimmed leaves from the machine.

2. In a machine for stemming leaves, the combination with a plurality of devices for operating upon said leaves, of a plurality of traveling grippers adapted to seize the stems of leaves, a traveling member adapted to hold said leaves whose stems are held by said grippers, and a flanged roller cooperate with said grippers for removing therefrom any scrap or waste collected by said grippers during their operation.

3. In a leaf stemming machine, the combination with a plurality of sets of traveling grippers, of devices for feeding leaves with their stems positioned in the path of travel of said grippers to be gripped thereby, and moved in one direction, a traveling member moving in the opposite direction and adapted to hold the webs of said leaves, and traveling means associated with said grippers and member for simultaneously cleaning said gripping elements and preventing buckling of the tips of leaves being stemmed by positively maintaining the stemmed leaf portions upon said member.

4. In a stemming machine, a traveling gripper mechanism provided with means for gripping the stems of leaves, a member having means for holding the web portions of leaves to be stemmed, means for feeding leaves to said mechanism and means for imparting relative separating movement to said mechanism and member for removing the stems of said leaves, and a rotating device operating concurrently therewith for cleaning said grippers, and tear-
In a stemming machine, a gripper member provided with means having relatively movable opposed gripping elements for gripping the stems of leaves, a member having means for holding the web portions of said leaves, means for feeding leaves to be stemmed to said members, means for imparting relative separating movement to said members, and a device operating concurrently therewith for clearing said gripping means, and supporting portions of the webs of said leaves upon said holding member.

In a stemming machine, a gripper member provided with means for gripping the stems of leaves, a member having means for holding the web portions of said leaves, means for imparting relative separating movement to said members and a roller having several flanges located between said members and rotating in a direction opposite to the direction of movement of said gripper member at its zone of cooperation therewith, said flanges being spaced apart along a substantial portion of the length of said roller, and adapted to engage the web portions of the leaves in correspondingly spaced regions of running contact, said flanges being very narrow at their peripheral edges and providing relatively wide spaces between said edges.

7. In a machine for stemming leaves, the combination with a rotary member provided with a plurality of series of grippers, of a rotating suction drum for supporting said leaves, means for feeding leaves tip foremost between said member and drum, and a rotary member having several flanges cooperating with said drum and the first rotary member and rotating in a direction opposite to that of said drum, said flanges being relatively narrow and spaced apart by relatively wide spaces at their peripheries, the flanges being adapted to engage the web portions of the leaves in correspondingly spaced regions of running contact after the stemming operation.

8. In a leaf stripping mechanism comprising a rotating drum for supporting leaves to be stripped, a rotating drum provided with annular rows of relatively movable opposed gripping members for seizing the stems of said leaves, means for rotating drums in opposite directions to strip the stems from leaves fed to said drums, and a member acting concurrently therewith and having projecting portions entering between said rows for cleaning said gripping members and tearing the webs of said leaves from the stems.

9. A stemming machine comprising a rotating conveyor provided with a plurality of grippers, a rotating conveyor provided with means for maintaining thereon the leaves being stemmed and adapted to rotate in a direction opposite to said first named conveyor, and a traveling member positioned adjacent said conveyors and close to the point of separation of the leaf blades and stem for simultaneously tearing web portions from the stems of said leaves in a limited zone and for cleaning said grippers.

10. A stemming machine comprising a rotating conveyor provided with a plurality of grippers, a rotating conveyor provided with means for maintaining thereon leaves being stemmed and adapted to rotate in a direction opposite to said first named conveyor and a rotary flanged roller positioned adjacent and beneath said conveyors cooperating therewith and at its zone of cooperation with the gripper conveyor having a relative opposite movement thereto and adapted to simultaneously separate portions of the webs of leaves from said stem and to clean said grippers.

11. A stemming device comprising a rotating member provided with a plurality of relatively movable gripper jaws for gripping the stems of leaves fed thereto, a stripping device for ejecting stems from said jaws, and a cleaning element located adjacent said jaws and cooperating therewith for cleaning said jaws during the stemming operation, said cleaning element having projecting portions entering between adjacent jaws.

12. In a stemming device, a rotating member provided with a plurality of sets of grippers, means for progressively operating sets of said grippers during rotation of said member to progressively grip portions of stems of leaves fed thereto, and a flanged roller located adjacent said member and cooperating with the grippers to clean said grippers during the stemming operation.

13. In a stemming mechanism, a rotary member provided with a plurality of parallel sets of laterally spaced grippers, means for operating each set of grippers progressively, and a flanged roller located adjacent said grippers, the flanges of the roller being conical in shape and adapted to fit between the grippers, coact with the rear walls thereof, and remove therefrom scrap and waste tending to collect therein.

14. In a stemming machine, a traveling member provided with a plurality of sets of grippers, each set of said grippers including a stationary element provided with a plurality of jaws and a movable element provided with a plurality of jaws, means for moving said elements relative to one another whereby one set of jaws closes and grips stems of leaves fed thereto, and a cleaning member located adjacent said grippers provided with a plurality of flanges adapted to enter between the operative faces of each set of said grippers for cleaning therefrom any scrap and waste collected during their stem stripping operation.

15. In a machine for stemming leaves, a suction conveyor for holding leaves to be stemmed, a conveyor provided with a plurality of series of stem pullers, means for feeding leaves to be stemmed to said conveyors, means for moving said conveyors in opposite directions to pull the stem apart from the blade of the leaf, and a device located below and adjacent both of said conveyors between the blade and stem adjacent the parting position, said device having portions entering between adjacent series of stem pullers for simultaneously separating portions of the leaves from the stem as it is being pulled from said leaf and for cleaning said pullers.

16. A leaf stemming device for use with a leaf holding member, comprising a shaft, several spaced flanges circumferentially arranged upon said shaft, some of said flanges during the stemming operations being adapted to straddle the stem of a leaf being stemmed, and tear therefrom portions of the web adjacent the stem, and others of said flanges being adapted to assist in holding said web portions upon said stem, said flanges being arranged to provide numerous grooves between them at least substantially equal in depth to the diameter of the leaf stem to be received therebetween, whereby each groove and its two adjacent flanges are adapted to cooperate in accommodating and holding the stem.
portion and attached web portions in an indefinite number of positions which the leaf may assume.

17. In a leaf stemmer in which the stem is parted from the blade portion, the combination with a traveling leaf holding member, of a shaft having a plurality of spaced circumferentially arranged flanges thereon, pairs of said flanges during the stemming operation being adapted to straddle the stem of a leaf being stemmed, said flanges being positioned adjacent said holding member between the blade portion and the stem portion of the leaf being stemmed adjacent to the parting point between said blade and stem to tear the web from the stem and to assist in holding the web portion on said holding member.

18. In a stemming machine, the combination with a web holding device, of a stem holding device, said devices being movable to convey the web and stem along diverging paths, a roll cooperating with said devices positioned between said diverging paths adjacent the point of separation thereof and having a relatively low portion for the passage of a leaf stem held by said stem holding device, and a portion of said roll having a relatively high portion constructed to engage with portions of the leaf on opposite sides of the stem to strip said web portion from the stem, and operating means for said stem holding device for causing the same to act on the stem prior to separation thereof from the web.

20. In a stemming machine, the combination with a plurality of drums having lower portions rotating divergently and one of said drums acting as a suction conveyor for holding feeding leaves being stemmed, of a rotating roller, having several laterally spaced peripheral flanges separated by deep grooves adapted to receive the stem between adjacent flanges at any one of a plurality of positions, cooperating with said conveyor for tearing web portions adjacent both sides of a stem, from said stem, in each of an indefinite number of positions which the leaf may assume, and means to rotate said roller with the lower portion of its periphery moving divergently with respect to the direction of rotation of the lower periphery of said suction conveyor, thereby aiding to feed the stemmed portions of the leaves by directly contacting the stemmed portions.

21. In a stemming device, means to feed the leaves to be stemmed, and a rotating roller provided with several uniformly spaced circumferential flanges adapted to receive a tobacco leaf stem between them at any one of a plurality of positions and each constituting a stripping member adapted to tear web portions of leaves from close to their stems, a stem advancing means, and means to rotate said roller with its lower periphery moving divergently from the path of the stripped leaves, and in a direction contrary to the direction in which the stems stripped from said leaves are advanced.

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