

Oct. 23, 1956

R. B. BENTLEY

2,767,535

TAPE WRAPPING MACHINE AND METHOD

Filed June 23, 1955

3 Sheets-Sheet 1

Fig. 1.

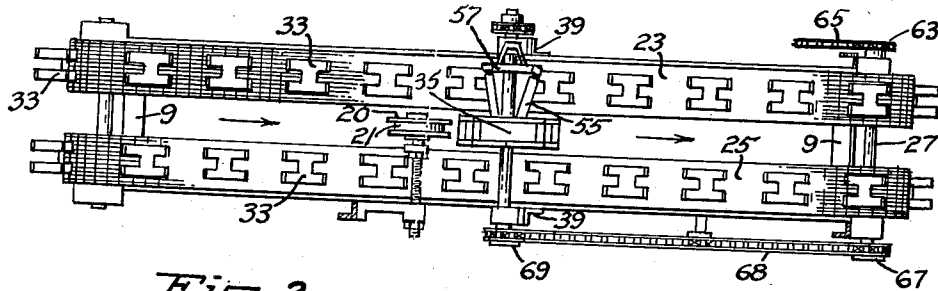
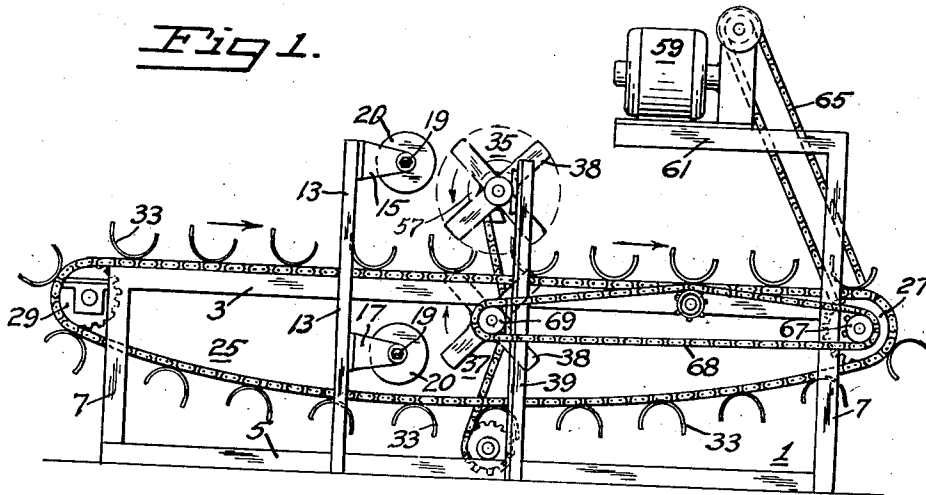
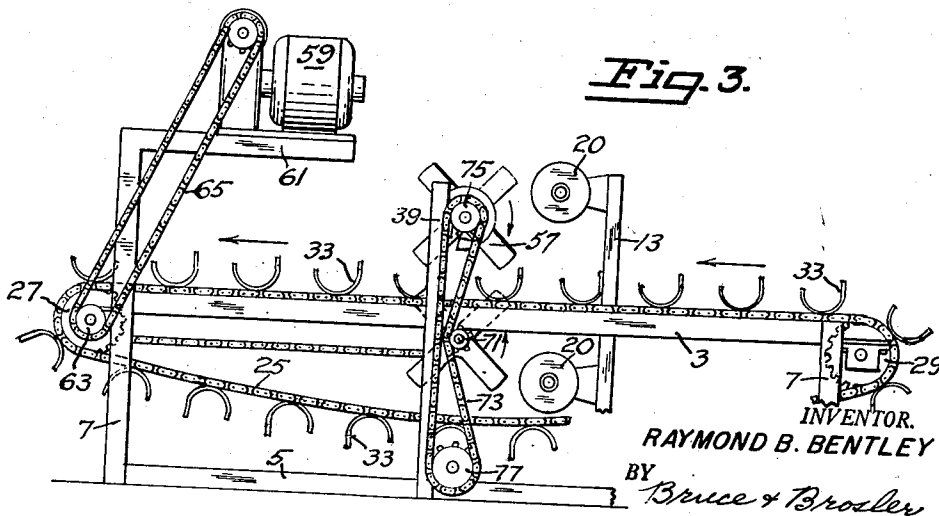


Fig. 2.

Fig. 3.



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3 Sheets-Sheet 2

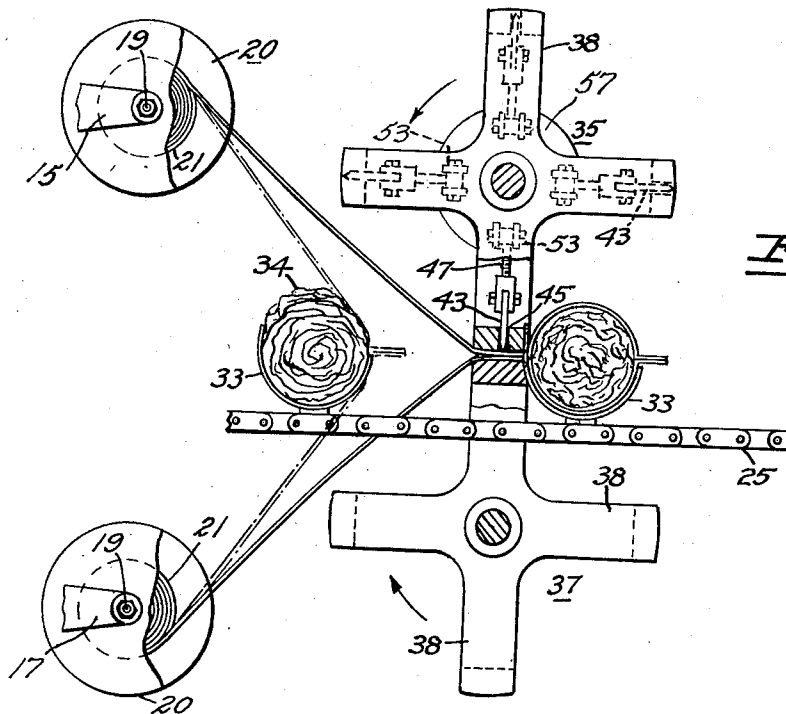


Fig. 4.

Fig. 5.

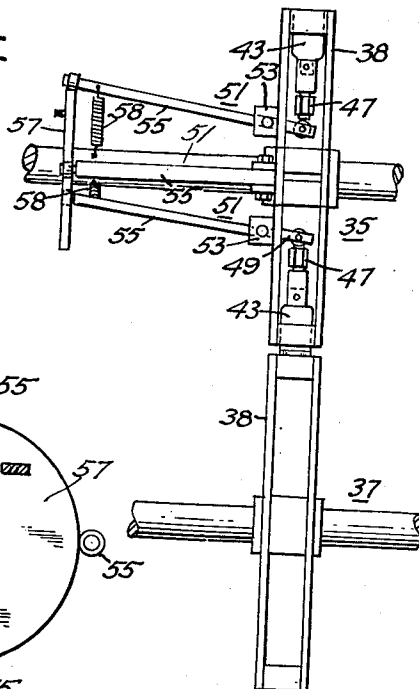


Fig. 6.

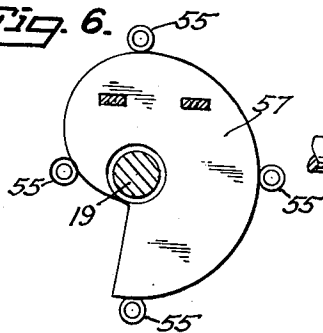
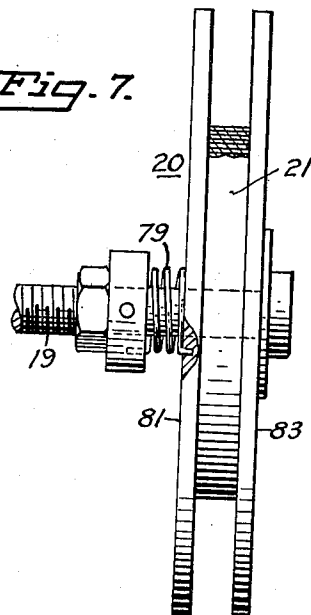


Fig. 7.



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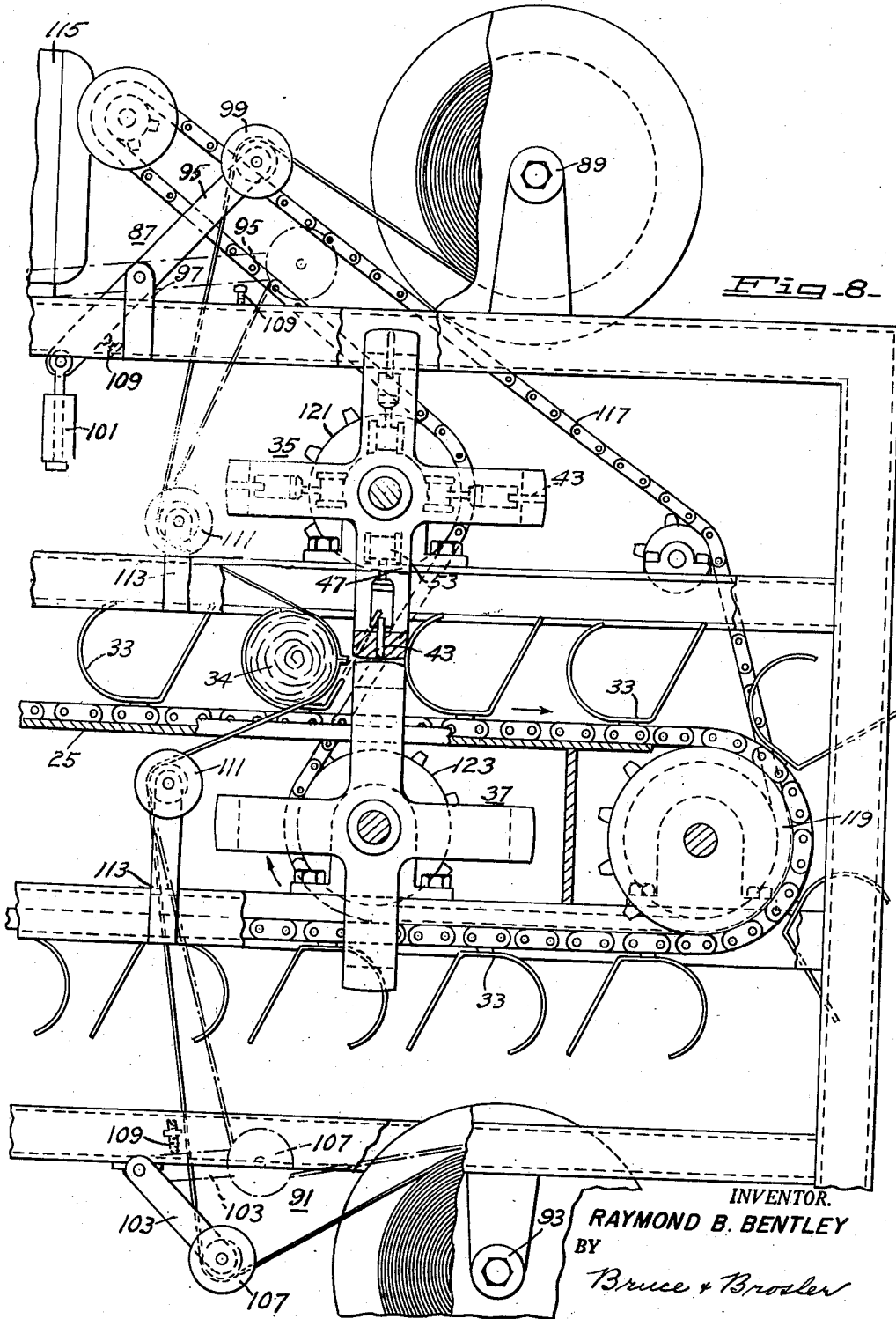
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3 Sheets-Sheet 3



1

2,767,535

TAPE WRAPPING MACHINE AND METHOD

Raymond B. Bentley, Pacific Grove, Calif.

Application June 23, 1955, Serial No. 517,728

16 Claims. (Cl. 53—198)

My invention relates to the packaging of items involving bunched elements and more particularly to a tape wrapping machine and method employable in the binding of items such as celery or the like.

This application is a continuation-in-part of my co-pending application for Tape Wrapping Machine and Method, Serial No. 429,480, filed May 13, 1954, now abandoned.

Among the objects of my invention are:

1. To provide a novel and improved machine for packaging items involving bunched elements;
2. To provide a novel and improved machine for the binding of items such as celery or the like;
3. To provide a novel and improved machine for binding celery or the like in a rapid and uniform manner;
4. To provide a novel and improved machine for binding celery or the like, which machine is substantially automatic in operation;
5. To provide a novel and improved method of binding items involving bunched elements;
6. To provide a novel and improved method of binding items such as celery or the like;
7. To provide a novel and improved method of binding celery or the like which will minimize damage thereto.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same taken in conjunction with the accompanying drawings wherein,

Figure 1 is a side view in elevation of a machine embodying the principles of the present invention and capable of functioning in accordance with the method of the present invention;

Figure 2 is a plan view of the machine of Figure 1;

Figure 3 is a view in elevation of the machine of Figure 1 as seen from the opposite side;

Figure 4 is a view in elevation of important components of the machine of Figure 1, partially broken away to expose details;

Figure 5 is a view depicting details of construction and function of certain of the components of Figure 4;

Figure 6 is a view of a cam detail appearing in Figure 5;

Figure 7 is a view illustrating details of reels for holding tape rolls employed in the use of the machine of Figure 1; and

Figure 8 is a view in elevation depicting a modified form of means for operatively supporting the tape rolls.

Referring to the drawings for details of the invention in its preferred form, the machine illustrated therein involves a box type frame 1 including upper and lower side rails 3 and 5 respectively, which are maintained in vertical spaced relationship by the vertical spacer members 7 connecting the upper rail and lower rail of a side, the frame sides being connected by horizontal cross

2

members 9 connecting the upper side rails and similar cross-members connecting the lower side rails.

A vertical support member 13 affixed at an intermediate point to the upper and lower rails of one side and extending above the upper rail, has mounted thereon a pair of shaft brackets 15 and 17 respectively, one being mounted at a point above the elevation of the upper rail, while the second is mounted at a point below the elevation of such upper rail. Each of these shaft brackets carries a shaft 19 extending transversely of the frame, on each of which is rotatably mounted, a reel 20 for holding a roll 21 of adhesive tape in spaced relationship to the other in a common vertical plane through substantially the longitudinal axis of the frame. With the rolls so mounted, the free ends of the tape may be brought together and sealed.

Carrier means are provided for conveying items in succession along a path leading toward the junction of the tapes when so joined, to bring each such item into adhesive engagement with the tapes and cause the same to wrap themselves about such item as the item continues its movement along such path.

Such carrier means may take the form of a pair of conveyor belts 23 and 25 respectively, preferably of the link chain type, supported at one end of the frame by pulley drive means 27 and at the other end of the frame by pulley idler means 29, the conveyors being laterally spaced with respect to each other, with one conveyor located to one side of the adhesive tapes while the other conveyor is located to the other side thereof.

Each conveyor belt carries a plurality of uniformly spaced cradles 33, the cradles on one belt each being in alignment, transversely of the frame, with a cradle on the other belt, to jointly carry an item 34 to be wrapped.

As the foremost item engages the adhesive tapes and causes the same to wrap themselves about the item, the wrapping of such items is completed by forcing the two tapes into sealing engagement over a region closely adjacent the trailing edge of the item, and then severing such tapes along an intermediate portion of such region to free the wrapped item and leave the tapes secured together in preparation for the next item to be wrapped.

The sealing of the tapes to complete the wrapping operation is accomplished through the utilization of a pair of star wheels 35 and 37 respectively, having like numbers of spokes which preferably are hollow and open sided, with the circumferential spacing between spokes equal to the spacing between successive cradles on the conveyor belts if the linear velocity of spoke ends and the conveyors is the same. Otherwise, a change in spacing would be called for to assure sealing of the tapes adjacent the trailing edge of each item.

These star wheels are rotatably supported in a common plane between the conveyor belts and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring closely adjacent the trailing edge of the item being wrapped.

To locate and support the star wheels as indicated, I provide a vertical upright member 39 at each side of the frame, and on each of these is mounted an upper bearing above the elevation of the upper rail, and a lower bearing below the elevation of the upper rail, the upper bearings supporting the shaft for the upper star wheel, while the lower bearings carry the shaft for the lower star wheel.

For severing the tapes at the appropriate point to free the wrapped item and leave the ends of the tape rolls secured together for the next oncoming item, I incorporate in each of the spokes of the upper star wheel, a

knife blade 43, reciprocally supported in a slot 45 in the end of the spoke in which it is located. The blade is hingedly secured to the end of an adjustable link 47, the other end of which is hinged to the short arm 49 of a lever 51 extending into the spoke through a side wall thereof and fulcrumed on a bracket 53 mounted on such spoke wall adjacent the opening therein. The exposed arm 55 of each lever rides the surface of a fixed cam 57 mounted on one of the upper bearings. A spring 58 anchored under tension between each such lever and the star wheel shaft holds the lever against the cam, the contour of the cam being such as to gradually retract a blade toward the hub of the star wheel until the tapes are in the process of being joined, at which instant the lever slips off the high spot of the cam and under the action of its associated spring, causes the blade to advance sharply and strike a cutting blow against the tapes.

To realize coordinated and properly timed movements between the conveyors and the star wheel, they are both driven from a common source such as an electric motor 59 mounted on a platform or support 61 at the drive end of the machine. A sprocket 63 mounted at one end of the pulley drive means of the conveyors, is connected by a drive chain 65 to the electric motor and thus effects a drive connection to the conveyors.

From the other end of the pulley drive means, a sprocket 67 is connected by a chain 68 to a sprocket 69 mounted at one end of the lower star wheel shaft to effect a drive connection to such star wheel.

Inasmuch as the upper star wheel must rotate in a direction opposite to that of the lower star wheel, the drive connection to this star wheel must take this factor into consideration. Accordingly, on the opposite end of the lower star wheel shaft, a drive sprocket 71 is mounted to engage a chain loop 73 which encircles a sprocket 75 on the corresponding end of the upper star wheel shaft and an idler sprocket 77 rotatably mounted at a lower point on the frame of the machine.

Thus the drive connections to the conveyors and the star wheels all stem from a common source, and when once adjusted, synchronism and timing between such components will be automatically maintained.

In the operation of the machine, the ends of the tape rolls are first stuck together and the machine then set in motion. The items to be wrapped, such as celery for example, are then placed one by one in successive pairs of cradles. The movement of the conveyor belts carries the first of such items into engagement with the tapes to tension the same and at the same time to cause the tapes to wrap themselves around the item, in the course of which, a spoke from the upper star wheel and one from the lower star wheel will come together adjacent the trailing edge of such item and secure the tapes together at that location.

Simultaneous with the securing of the tapes, the knife blade housed in the spoke of the upper star wheel will sever such tapes along an intermediate section of the region which has just been stuck together. This frees the item which had just been wrapped, and at the same time leaves the two ends of the tape rolls adhesively secured together in position to be engaged by the next item in succession on the conveyors.

At the moment of severance of the tapes, it is desired that the secured ends of the tape rolls be pulled in toward the item coming up for wrapping, rather than leaving the tapes dangling. This will assure prompt starting of the next wrapping operation under tension, regardless of variation in size of the item to be wrapped. Each item, moreover, by its size determines the amount of adhesive tape unrolled for a wrapping operation.

For this purpose, a compression spring 79 is disposed about each tape reel shaft 19 with one end anchored to the shaft and the other end to the reel. The reel is preferably formed of a pair of disks 81, 83 between which is resiliently held a roll of tape under the com-

pressive action of the spring 79. Withdrawal of tape during the initial portion of the wrapping operation, results in a winding up of the spring, following which the frictional grip of the disks on the tape roll is overcome, whereby, for the balance of the wrapping operation, the roll will unwind relative to the reel. Upon severance of the tapes, the reels due to the wound up condition of the springs, will immediately rewind and take up the slack.

Inasmuch as the securing of the tapes by the star wheels occurs adjacent the trailing edge of the item in each instance, it follows, therefore, in conjunction with what has been previously said, that a tight wrap will result, despite wide variations in size of items fed into the machine.

In the alternative embodiment of slack take-up means depicted in Figure 8 of the drawings, I avoid the use of a rewind spring to take up the slack in the tapes following severance thereof, and in lieu thereof rely upon an upper slack take-up pulley assembly 87 associated with an upper tape roll holder 89, and a lower slack take-up pulley assembly 91 associated with a lower tape roll holder 93.

The upper of these slack take-up pulley assemblies involves a lever 95 fulcrumed at an intermediate point thereof to a fulcrum post 97 on the machine frame. At one end of the lever is mounted a pulley 99 while at the other end is suspended a counter-weight 101 of a value sufficient to over balance the weight of the pulley and lift the same in the absence of a restraining force sufficient to overcome the effect of the weight.

The second slack take-up pulley assembly involves a lever 103 which is fulcrumed at one end on the machine frame, while at its other end, is mounted a pulley 107, such pulley and lever being adapted to drop under the pull of gravity, in the absence of a restraining force overcoming the same.

In use, the tape coming off of each of the tape rolls, is first passed around the associated slack take-up pulley before being joined to the tape coming off of the other tape roll. As the item to be taped-wrapped, engages the tapes so joined, the resulting tension developed in the tapes, will cause the upper slack take-up pulley to be lowered and the lower slack take-up pulley to be lifted, and this condition prevails as the item moves forward toward the star wheels and until the tapes are again joined and severed, following which, the resulting joined ends of the tapes will be released, whereupon the slack take-up pulleys become free to move outwardly with respect to each other and thereby take up the slack in the tapes until an oncoming item again engages the tapes, and in conjunction with the slack take-up pulley assemblies, again cause tension to be developed in the tapes.

Adjustable stops 109 may be provided at convenient locations on the machine frame with respect to the slack take-up pulley assembly levers, to limit the extent of movement of such levers.

Preferably, the permissive extent of the outward movements of the slack take-up pulleys should just about balance each other, to assure that the item to be wrapped shall engage the tapes at the joined ends thereof.

The overall length of the machine may be somewhat reduced by supporting the tape rolls above or slightly to the front of the star wheels as illustrated in Figure 8 in which case, an idler guide pulley 111 is included in each slack take-up pulley assembly, such idler guide pulley being mounted on a frame stub member 113 somewhat to the rear of the star wheels, such idler guide pulleys serving to avoid interference between the tapes and the star wheels, and at the same time cause the tapes to approach within a desirable angular range, the item to be wrapped.

As in the first embodiment of the invention, all driven components operate from a common motor 115, to which they are drive connected by a chain 117 threading around a conveyor sprocket 119, and upper and lower star wheel sprockets 121 and 123 respectively.

5

While this alternative form of slack take-up means functions on a different principle than the spring rewind slack take-up means first described, insofar as the effect of each on the tapes is concerned, such effect is substantially the same in either case. The slack created by the severance of the tapes is quickly taken up by drawing the joined ends of the tapes in toward an oncoming item on the conveyor means, until there is engagement between such item and the joined tapes, whereupon tension develops in the tapes, causing the same to wrap themselves about the item, as the item moves forward toward the star wheels, which then complete the wrapping operation and prepare the tapes for the next item to come along on the conveyor.

In lieu of utilizing rolls of adhesive coated tape as described, the machine may readily be accommodated to the use of tape of other and well known types.

It will be apparent from the foregoing that the machine just described will fulfill all the objects of my invention and while I have described the same in its preferred form, and in considerable detail, the same is subject to alteration and modification without departing from the underlying principles involved. I, accordingly, do not desire to be limited in my protection to such details except as may be necessitated by the appended claims.

I claim:

1. A tape wrapping machine comprising conveyor means for carrying items to be wrapped with tape, a pair of tape roll holders, means for securing together, tapes from a pair of tape rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means.

2. A tape wrapping machine comprising conveyor means for carrying items to be wrapped with tape, said conveyor means including a conveyor having a plurality of uniformly spaced cradles, a pair of tape roll holders, means for securing together, tapes from a pair of tape rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means, said tape retracting means including a slack take-up pulley assembly associated with each of said tape roll holders.

3. A tape wrapping machine comprising conveyor means for carrying items to be wrapped with tape, said conveyor means including a conveyor having a plurality of uniformly spaced cradles, a tape roll holder above said conveyor, a tape roll holder below said conveyor, means for securing together, tapes from a pair of tape rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means, said tape retracting means including a slack take-up pulley assembly associated with said upper tape roll holder and a lower slack take-up pulley assembly associated with said lower tape roll

6

holder, said first slack take-up pulley involving a lever fulcrumed at an intermediate point and having a pulley at one end, and a counter-weight at its other end sufficient to over balance said pulley and lift the same in the absence of a restraining force, said second slack take-up pulley assembly involving a lever fulcrumed at one end and having a pulley at its other end, said latter pulley being adapted to drop under force of gravity in the absence of a restraining force.

4. A tape wrapping machine comprising conveyor means for carrying items to be wrapped with tape, said conveyor means including a conveyor having a plurality of uniformly spaced cradles, a tape roll holder above said conveyor, a tape roll holder below said conveyor, means for securing together, tapes from a pair of tape rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means, said tape retracting means including a slack take-up pulley assembly associated with said upper tape roll holder and a lower slack take-up pulley assembly associated with said lower tape roll holder, said first slack take-up pulley involving a lever fulcrumed at an intermediate point and having a pulley at one end, and a counter-weight at its other end sufficient to over balance said pulley and lift the same in the absence of a restraining force, said second slack take-up pulley assembly involving a lever fulcrumed at one end and having a pulley at its other end, said latter pulley being adapted to drop under force of gravity in the absence of a restraining force, and stop means for limiting the extent of movement of each of said slack take-up pulleys.

5. A tape wrapping machine, comprising a pair of tape roll holders lying in spaced relationship in a common vertical plane, conveyor means extending between said tape roll holders and having means for holding items to be wrapped, means for securing together tapes from a pair of such rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means.

6. A tape wrapping machine, comprising a pair of tape roll holders lying in spaced relationship in a common vertical plane, conveyor means extending between said tape roll holders, said conveyor means including a pair of laterally spaced conveyors, one on either side of the plane of said tape roll holders, and having aligned means for holding items to be wrapped, means for securing together tapes from a pair of such rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for retracting the secured ends of such tapes toward an oncoming item on said conveyor means to take up the slack in such tapes and effect a tensioning thereof following engagement with such item and before such item reaches said tape securing means.

7. A tape wrapping machine, comprising a pair of tape roll holders lying in spaced relationship in a common vertical plane, conveyor means extending between said tape roll holders, said conveyor means including a pair of laterally spaced conveyors, one on either side of the plane of said tape roll holders, and carrying aligned cradles in

7 which to support items to be wrapped, means for securing together tapes from a pair of such rolls and over an area of such tapes when such rolls are carried by said tape roll holders, means for severing such tapes along an intermediate portion of such area to release such tapes with their resulting ends secured together, and means for re-
tracting the secured ends of such tapes toward an oncom-
ing item on said conveyor means to take up the slack in
such tapes and effect a tensioning thereof following en-
gagement with such item and before such item reaches
said tape securing means.

8. A tape wrapping machine comprising conveyor means for carrying items to a station for completion of a wrapping of each item with tape, said conveyor means including a plurality of uniformly spaced cradles, a pair of tape roll holders, means for securing together at said station adjacent the trailing edge of each such item, tapes from a pair of tape rolls and over an area of such tapes, when such rolls are carried by said tape roll holders, said tape securing means involving a pair of star wheels having a like number of spokes, with the circumferential spacing between spokes equal to the spacing between successive cradles of said conveyor means, and means rotatably supporting said star wheels in a common plane and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of en-
gaging spoke ends occurring adjacent the trailing edge of the item being wrapped.

9. A tape wrapping machine comprising conveyor means for carrying items to a station for completion of a wrapping of each item with tape, said conveyor means including a plurality of uniformly spaced cradles, a pair of tape roll holders, means for securing together at said station adjacent the trailing edge of each such item, tapes from a pair of tape rolls and over an area of such tapes, when such rolls are carried by said tape roll holders, said tape securing means involving a pair of star wheels having a like number of spokes, with the circumferential spacing between spokes equal to the spacing between successive cradles of said conveyor means, means rotatably supporting said star wheels in a common plane and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring adjacent the trailing edge of the item being wrapped, and means for severing such tapes along an intermediate portion of such area to free such wrapped item and release such tapes with their re-
sulting ends secured together.

10. A tape wrapping machine comprising conveyor means for carrying items to a station for completion of a wrapping of each item with tape, said conveyor means including a plurality of uniformly spaced cradles, a pair of tape roll holders, means for securing together at said station adjacent the trailing edge of each such item, tapes from a pair of tape rolls and over an area of such tapes, when such rolls are carried by said tape roll holders, said tape securing means involving a pair of star wheels having a like number of spokes, with the circumferential spacing between spokes equal to the spacing between successive cradles of said conveyor means, means rotatably supporting said star wheels in a common plane and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring adjacent the trailing edge of the item being wrapped, and means for severing such tapes along an intermediate portion of such area to free such wrapped item and release such tapes with their resulting ends secured together, said severing means including a reciprocable knife blade in each of the spokes of one of said star wheels and adapted to emerge through the end of its associated spoke into engagement with the peripheral contacting spoke end of the other star wheel.

11. A tape wrapping machine comprising conveyor means for carrying items to a station for completion of a wrapping of each item with tape, said conveyor means

including a plurality of uniformly spaced cradles, a pair of tape roll holders, means for securing together at said station adjacent the trailing edge of each such item, tapes from a pair of tape rolls and over an area of such tapes, when such rolls are carried by said tape roll holders, said tape securing means involving a pair of star wheels having a like number of spokes, with the circumferential spacing between spokes equal to the spacing between successive cradles of said conveyor means, rotatably supporting said star wheels in a common plane and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring adjacent the trailing edge of the item being wrapped, and means for severing such tapes along an intermediate portion of such area to free such wrapped item and release such tapes with their resulting ends secured together, said severing means including a reciprocable knife blade in each of the spokes of one of said star wheels and adapted to emerge through the end of its associated spoke into engagement with the peripheral contacting spoke end of the other star wheel, a lever entering each spoke of said knife blade containing star wheel and fulcrumed thereto, with the inner end of such lever hingedly connected to the reciprocal knife blade therein, and cam means engaged by the exterior end of each lever during rotation of said star wheel for reciprocating each such knife blade and urging the same against the corresponding spoke end of the other star wheel during engagement between such spokes.

12. The method of wrapping bunched items comprising securing together the free ends of two rolls of tape, moving said bunched items against the junction of said tapes, wrapping said tapes under tension about said items, joining said tapes over an area adjacent the trailing edge of said items, severing said tapes along an intermediate portion of said area to complete the wrapping of said bunched items and leave the remaining ends of said tapes secured together in preparation for another wrapping, moving a succeeding bunch of items toward the resulting secured ends of said tapes, and simultaneously retracting said secured tapes toward said oncoming bunch to take up slack in said tapes and tension the same before completing a wrapping of said succeeding bunch of items.

13. The method of wrapping bunched items comprising adhesively securing together the free ends of two rolls of adhesive tape, moving said bunched items against the junction of said tapes, wrapping said tapes under tension about said items, adhesively securing said tapes over an area adjacent the trailing edge of said items, severing said tapes along an intermediate portion of said area to complete the wrapping of said bunched items and leave the remaining ends of said tapes adhesively secured together in preparation for another wrapping, moving a succeeding bunch of items toward the resulting secured ends of said tapes, and simultaneously retracting said secured tapes toward said oncoming bunch to take up slack in said tapes and tension the same before completing a wrapping of said succeeding bunch of items.

14. A tape applying machine comprising a conveyor for advancing items to be wrapped in spaced relation along a predetermined path, tape dispensing means being arranged to support lengths of tape whose terminal ends are joined together to provide a continuous tape disposed across the path of the items, means associated with said dispensing means for tensioning said tape, means for actuating said conveyor to carry a first item along said path in contact with said tape to drape the tape around the forward portion of the item and along the sides thereof, pressure means disposed adjacent said conveyor and movable into engagement with portions of said tensioned tape rearwardly of the first advancing item to press opposing portions of the tape into sealing engagement over a predetermined area and thereby band the item, and cutter means for severing said tape at said area releasing the joined portions of the tape behind the cutter means, whereby said joined tape portions are snapped rearwardly

under the action of said tensioning means into contact with the next item advanced on said conveyor.

15. A tape wrapping machine comprising a frame including upper and lower side rails, vertical spaced members connecting the upper rail and lower rail of a side, horizontal cross members connecting the lower side rails; means for rotatably holding a pair of rolls of adhesive tape in spaced relationship to each other in a common vertical plane, said means involving a spindle support on said frame, including a vertical support member affixed to the upper and lower rails of one side and extending above said upper rail, a shaft bracket mounted on said upper rail, a shaft bracket mounted on said vertical support member at a point below the elevation of said upper rail, a shaft bracket mounted on said vertical support member at a point above the elevation of said upper rail, a shaft carried by each of said brackets and extending transversely of said frame; a roll of adhesive tape on the upper of said shafts in substantially the vertical plane through the longitudinal axis of said frame and a second roll of adhesive tape on the lower of said shafts in substantially the same plane, said tapes having their free ends adhesively secured together; means for conveying items in succession along a path in said plane between said adhesive tape rolls to bring such an item into adhesive engagement with said tapes and tension the same to cause said tapes to adhesively wrap about such item, said means involving a conveyor including a drive pulley means at one end of said machine frame, idler pulley means at the other end of said frame, a pair of belts around said drive and idler pulley means, one such belt lying to one side of the plane of said tapes and the other of said belts lying to the other side of said plane, and a plurality of item holding means on each of said belts, item holding means on one belt, each being in alignment transversely of said frame with an item holding means on the other belt to jointly carry an item to be wrapped; means for adhesively securing said tapes together over a region adjacent the trailing edge of each item in succession as they are carried along and while said tapes are under tension, to complete a wrapping of each such item, said means involving a pair of star wheels having like number of spokes, with the circumferential spacing between spokes equal to the spacing between successive item holding means; means rotatably supporting said star wheels in a common plane between said conveyor belts and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring adjacent the trailing edge of the item being wrapped; and means for severing such tapes along an intermediate portion of such region to free such wrapped item and leave such tapes secured in preparation for a successive item to be wrapped, said means including a reciprocable knife blade in each of the spokes of one of said star wheels and adapted to emerge through the end of its associated spoke into engagement with the peripheral contacting spoke end of the other star wheel, a lever entering each spoke of said knife blade containing star wheel and fulcrumed thereto, with the inner end of such lever hingedly connected to the reciprocal knife blade therein, and cam means engaged by the exterior end of each lever during rotation of said star wheel for reciprocating each such knife blade and urging it into engagement with the corresponding spoke end of the other star wheel during engagement therewith.

16. A tape wrapping machine comprising a box type frame including upper and lower side rails, vertical spaced members connecting the upper rail and lower rail of

a side, horizontal cross members connecting the upper side rails and horizontal cross members connecting the lower side rails; means for rotatably holding a pair of rolls of adhesive tape in spaced relationship to each other in a common vertical plane, said means involving a spindle support on said frame, including a vertical support member affixed to the upper and lower rails of one side and extending above said upper rail, a shaft bracket mounted on said vertical support member at a point below the elevation of said upper rail, a shaft bracket mounted on said vertical support member at a point above the elevation of said upper rail, a shaft carried by each of said brackets and extending transversely of said frame; a roll of adhesive tape on the upper of said shafts in substantially the vertical plane through the longitudinal axis of said frame and a second roll of adhesive tape on the lower of said shafts in substantially the same plane, said tapes having their free ends adhesively secured together; means for conveying items in succession along a path toward the free ends of said tapes when joined, to bring each such item into adhesive engagement with said tapes at the junction thereof and tension the same to cause said tapes to adhesively wrap about such item, said means involving a conveyor including a drive pulley means at one end of said machine frame, idler pulley means at the other end of said frame, a pair of belts around said drive and idler pulley means, one such belt lying to one side of the plane of said tapes and the other of said belts lying to the other side of said plane, and a plurality of cradles on each of said belts, the cradles on one belt, each being in alignment transversely of said frame, with a cradle on the other belt to jointly carry an item to be wrapped; means for adhesively securing said tapes together over a region adjacent the trailing edge of each item in succession as they are carried along and while said tapes are under tension, to complete a wrapping of each such item, said means involving a pair of star wheels having like numbers of spokes, with the circumferential spacing between spokes equal to the spacing between successive cradles; means rotatably supporting said star wheels in a common plane between said conveyor belts and in peripheral contact along corresponding spoke ends during rotation, with the region of contact of each pair of engaging spoke ends occurring adjacent the trailing edge of the item being wrapped; means for severing such tapes along an intermediate portion of such region to free such wrapped item and leave such tapes secured in preparation for a successive item to be wrapped, said means including a reciprocable knife blade in each of the spokes of one of said star wheels and adapted to emerge through the end of its associated spoke into engagement with the peripheral contacting spoke end of the other star wheel, a lever entering each spoke of said knife blade containing star wheel and fulcrumed thereto, with the inner end of such lever hingedly connected to the reciprocal knife blade therein, and cam means engaged by the exterior end of each lever during rotation of said star wheel for reciprocating each such knife blade and urging it into engagement with the corresponding spoke end of the other star wheel during engagement therewith; means following such severance for drawing in the joined ends of said tapes to meet the next oncoming items to be wrapped, and means for driving and coordinating the movements of said conveyor belts and star wheels.

No references cited.