

May 14, 1963

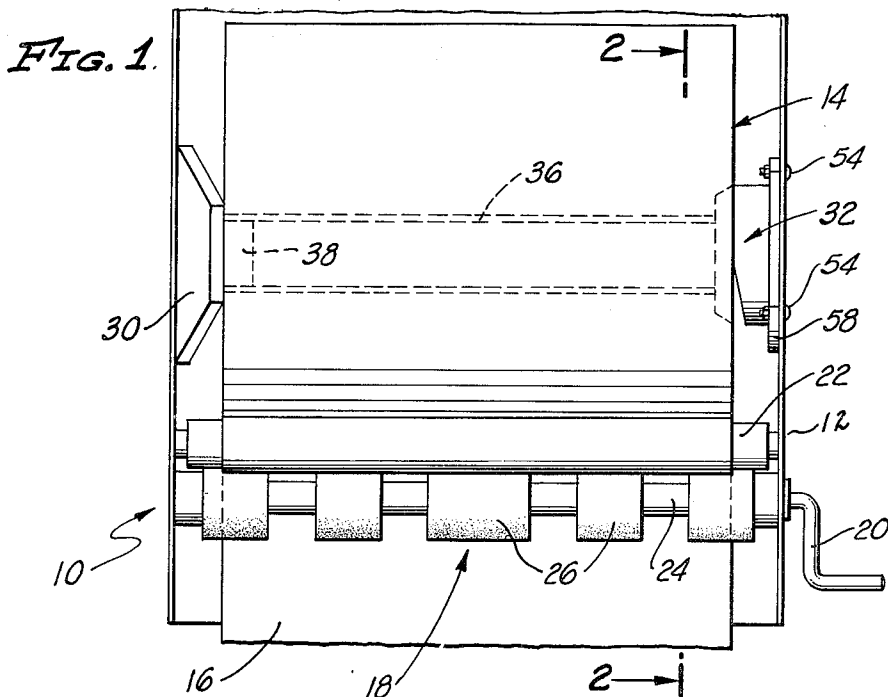
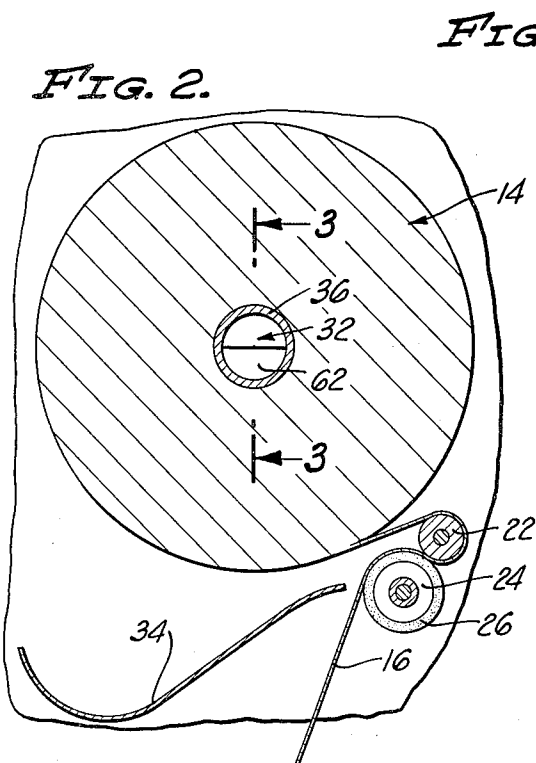
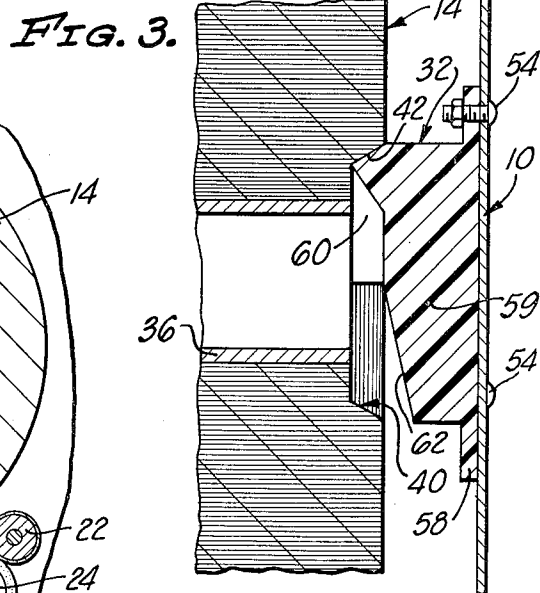
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3,089,659

METHOD OF AUTOMATICALLY DISMOUNTING ROLLED WEB MATERIAL

Filed April 11, 1960

2 Sheets-Sheet 1



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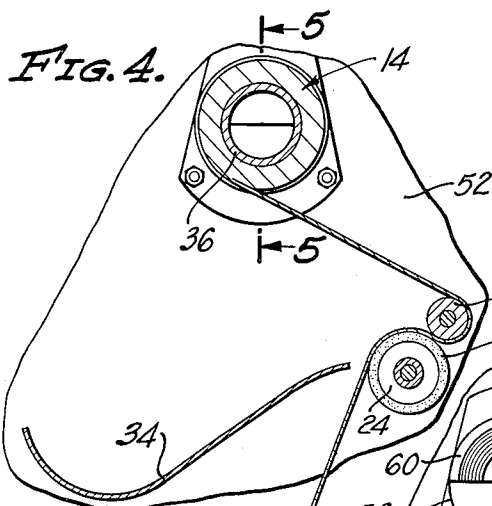
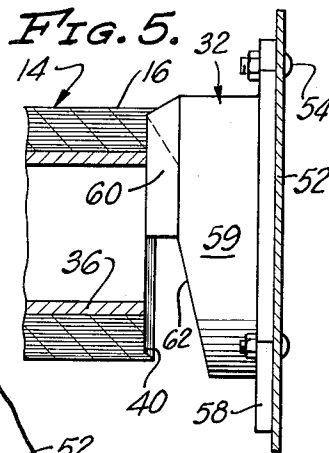
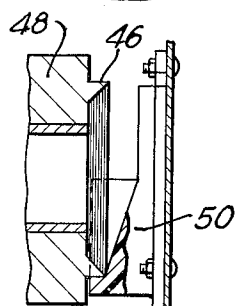
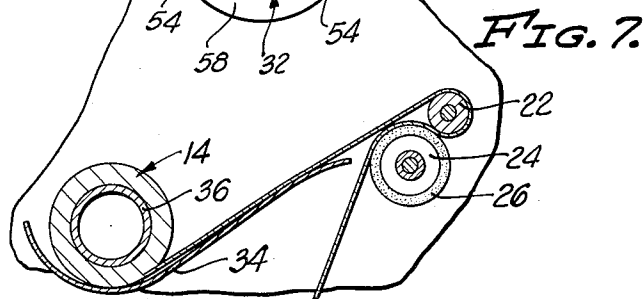
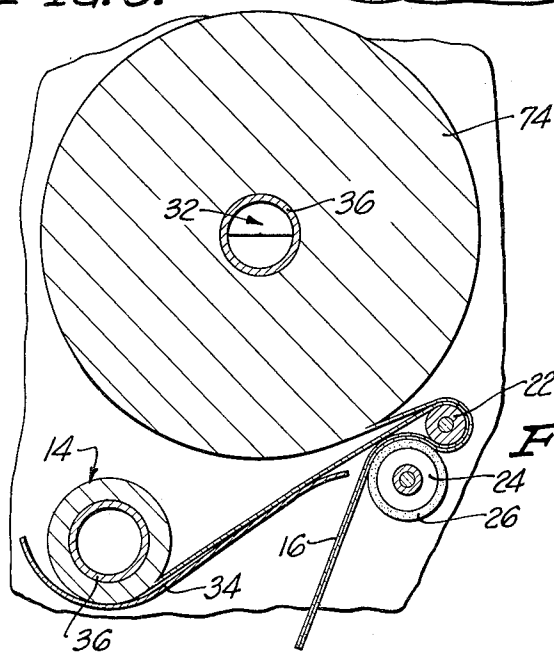
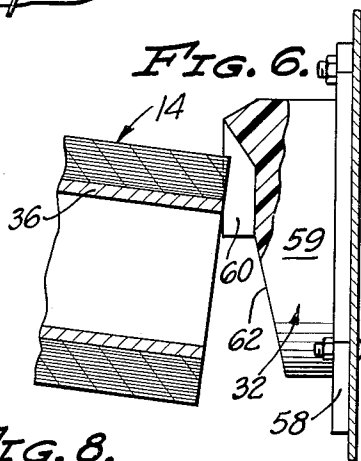
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1

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METHOD OF AUTOMATICALLY DISMOUNTING ROLLED WEB MATERIAL

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This invention relates to a method of automatically dismounting a partially consumed roll of strip material from operative engagement with an associated bearing member.

The method of the invention has application to a wide variety of different types of uses but has particular relevance when applied to the dispensing of various types of strip material in roll form. In illustrating the steps of the method, reference will be made to the utilization of the invention in the environment of a dispenser for paper toweling in roll form but it will, of course, be understood by those skilled in the art that the principles of the invention may be applied with equal cogency to various other types of strip material in roll form and to environments other than that of the dispensing art.

Conventional roll paper towel dispensers usually include bearings adapted to mount the roll of paper in the dispenser and one of the common difficulties encountered in the servicing of such dispensers is the fact that the custodian will frequently discard a partially exhausted roll of toweling and replace it with a full roll because of the possibility that the partially exhausted roll may be completely exhausted before he returns on his next servicing trip. Of course, the consequent waste of roll paper toweling is a serious economic factor where large installations of roll paper toweling dispensers exist.

On other occasions the custodian may remove a partially exhausted roll from the bearings therefor and insert a full roll while permitting the partially exhausted roll to remain in the cabinet so that paper from both rolls will be dispensed until the partially exhausted roll is completely exhausted. In such situations, the custodian must remove the roll of material from operative engagement with the bearings therefor. It is the expenditure of time and labor incident to the retention of the partially exhausted roll that frequently induces a cus-

dispensing of paper toweling in roll form. Of course, there are many other devices utilizing strip material in roll form and, particularly, rolls of paper where the necessity for replacement prior to complete exhaustion of the installed roll occurs and in such environments the principles of the invention can be applied with the same favorable economic results attained by the utilization of the principles of the invention in the dispensing of paper toweling in roll form.

It is, therefore, an object of the invention to provide a method for automatically dismounting a partially exhausted roll of paper toweling from the supporting bearings therefor in a paper towel dispenser so that, when the roll of paper toweling is partially exhausted, it will automatically be dismounted from the associated supporting bearings therefor and be moved from a first dispensing position to a second dispensing position within the dispensing cabinet. Therefore, when the custodian services the cabinet the partially exhausted roll has automatically moved from the supporting bearings and the custodian can immediately replace it with a full roll.

Thus, the normal tendency of the custodian to discard the partially exhausted roll or to avoid replacement of the partially exhausted roll with a full roll is eliminated and the consequent wastage of the partially exhausted roll or the inadequate servicing of the towel

2

dispenser is eliminated. Furthermore, the servicing time is substantially reduced because the attendant need not remove the partially exhausted roll from operative engagement with the supporting bearings therefor, but can actually immediately place a full roll on the supporting bearings because the partially exhausted roll has dropped downwardly into the second or auxiliary dispensing position.

Another advantage of the utilization of the automatic roll dismounting method of the invention is the fact that reliance is not had upon the discretion of the custodian to determine whether a roll is exhausted to the extent which would indicate that it should be replaced by a full roll since the automatic dismounting of the partially exhausted roll is an automatic indication to the custodian that a full roll is necessary. Therefore, the practice of the method of the invention eliminates the possibility of the premature exhaustion of the paper roll toweling in the dispenser.

An object of the invention is the provision of a method of automatically dismounting a roll of strip material from an associated supporting gearing, which includes the steps of forming a receptacle in one end of the roll to provide a bearing or supporting surface constituted by adjacent layers of the material of which the roll is constituted, and inserting said bearing in said receptacle in engagement with the supporting surface to support said end of the roll and, subsequently, reeling the material from the roll until the layers of material constituting the supporting surface have been consumed, thus permitting the end of the roll to drop downwardly in the dispenser and automatically dismount the roll from the associated bearing.

The bearing receptacle can, of course, be formed in the end of the roll in any predetermined location so that the theoretical point of exhaustion can be established either extremely close to the center of the roll or further outward as the needs of the situation may determine. Moreover, the receptacle can be formed in the end of the roll by any desired means such as cutting, pressing, or physical displacement of the material from which the roll is fabricated. Moreover, instead of a receptacle, the material of the roll can be caused to protrude beyond the plane of the end thereof, thus providing a protrusion formed from the material rather than a receptacle and this protrusion can be engaged by a corresponding bearing member to support the roll until the exhaustion of the material from which the protrusion is fabricated.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawings, which are for the purpose of illustration only, and in which:

FIG. 1 is a front elevational view of a paper roll towel dispenser which may be utilized in the practice of the method of the invention;

FIG. 2 is a vertical sectional view taken on the broken line 2—2 of FIG. 1;

FIG. 3 is an enlarged, fragmentary sectional view taken on the broken line 3—3 of FIG. 2;

FIG. 4 is a schematic view showing a partially exhausted roll of paper towel immediately prior to its automatic dismounting from an associated bearing member;

FIG. 5 is an enlarged, fragmentary sectional view taken on the broken line 5—5 of FIG. 4;

FIG. 6 is an enlarged, fragmentary sectional view showing the end of the partially exhausted roll as the roll falls from operative engagement with the associated bearing member;

FIG. 7 is a view showing the auxiliary dispensing position assumed by the partially exhausted roll after

its automatic dismounting from the associated bearing member;

FIG. 8 is a view similar to FIG. 7 showing the relationship between the partially exhausted roll and a full replacement roll; and

FIG. 9 is a fragmentary, sectional view showing the utilization of a projection constituted by a plurality of layers of material at the end of the roll rather than a receptacle formed in said material.

Referring to the drawings, and particularly to FIGS. 1-3 thereof, I show in schematic form a paper towel dispensing cabinet 10 which includes a housing 12 adapted to receive a roll 14 of paper toweling 16 and to dispense the paper toweling 16 from the cabinet by the utilization of a dispensing mechanism indicated generally at 18 and constituted by a dispensing handle 20 and juxtaposed dispensing rollers 22 and 24. The dispensing roller 24 is provided with a plurality of friction collars 26 adapted to engage upon the paper toweling 16 threaded between said collars and the adjacent surface of the dispensing roller 22. Therefore, rotation of the dispensing handle 20 will cause corresponding rotation of the rollers 22 and 24 and also cause the toweling 16 threaded therebetween to be dispensed from the dispenser 10.

It will be noted that the dispenser 10 includes a movable support bearing 30 and a fixed support bearing 32 adapted to engage the roll 14, in a manner to be described in greater detail below, and support said roll in a first dispensing position. Also provided in the towel dispenser 10 is an auxiliary support or receptacle 34 which is adapted to receive the roll 14 when it is partially exhausted.

The roll 14 of toweling 16 is, in the present instance, provided with an elongated core 36 which extends through the roll 14 and is engaged at its left-hand extremity, as viewed in FIG. 1 of the drawings, by a cylindrical bearing boss 38 provided upon the movable support bearing 30 which is normally biased into engagement with the roll 14 by means of a spring, not shown. The opposite end of the roll 14, that is, the right-hand end, as viewed in FIGS. 1 and 3 of the drawings, is provided with a bearing receptacle 40 which may be cut or otherwise formed in the paper toweling 16 and which incorporates an angularly oriented bearing wall 42 constituted by adjacent layers of paper toweling.

The core 36, as best shown in FIG. 3 of the drawings, has also been cut to terminate at the base of the bearing receptacle 40. While the bearing receptacle 40 is disclosed as being provided with an inclined or angularly-oriented supporting or bearing wall 42, it is conceivable that the wall 42 may be provided with a different orientation and that the receptacle 40 may be of an entirely different configuration from that shown in FIG. 3 of the drawings. In addition, the receptacle 40 may be formed in the material of which the roll 14 is constituted a further distance away from the center of the roll so that the roll 14 may be automatically dismounted from operative association with the supporting bearing 32 while a larger amount of paper toweling 16 is still on the roll 14.

In addition to providing various shapes of receptacles in the material or toweling 16 of which the roll 14 is constituted, it is possible to provide a protrusion 46 on the end of a roll 48, as best shown in FIG. 9 of the drawings, the protrusion 46 being constituted by superimposed and adjacent layers of material or toweling and being substantially circular in configuration and being adapted to be received in a supporting bearing 50. The protrusion 46 may be formed by cutting away the adjacent material of the roll 48 or by actually deforming the material at the end of the roll by placing a die or other forming element thereagainst.

The supporting bearing 32 is formed as an integral unit from synthetic plastics such as nylon or the like, and is secured to the adjacent wall 52 of the dispenser 10 by means of screws 54 or similar fasteners. The supporting

bearing 32, as best shown in FIGS. 3 and 7 of the drawings, includes a base 58 having a substantially cylindrical body 59 formed integrally therewith and incorporating an inverted, semi-circular bearing flange 60 of substantially triangular cross section. The body 59 has an inclined face 62 below the bearing flange 60 which is adapted to clear the end of the partially exhausted roll 14 as it is automatically dismounted from operative engagement with the supporting bearing 32.

The initial relationship of the roll 14 of toweling 16, and more particularly, the bearing receptacle 40 in the end thereof, with the bearing flange 60 of the supporting bearing 32 is best shown in FIGS. 1-3 of the drawings. In this position the semi-circular bearing flange 60 engages the supporting or bearing wall 42 of the bearing receptacle 40 which is constituted by adjacent layers of paper toweling and which thus serves as the only support for the right-hand end of the roll 14. The left-hand extremity of the roll 14 is, as best shown in FIG. 1 of the drawings, supported by the cylindrical supporting bearing 38 mounted on the movable support 30. Of course, the toweling 16 is threaded between the roller 22 and the friction collars 26 on the roller 24 to permit the lower extremity of the toweling 16 to depend from the housing of the dispenser 10.

Therefore, as toweling 16 is withdrawn, the roll 14 is rotated with reference to the supporting bearing 32 and, ultimately, the successive layers of toweling 16 defining the angularly inclined side wall 42 of the receptacle 40 are consumed, as best shown in FIGS. 4 and 5 of the drawings. When completely consumed or consumed to such an extent that the remaining layers of toweling 16 no longer provide adequate support, the right-hand extremity of the partially exhausted roll 14 will drop downwardly from operative engagement with the supporting bearing 32, as best shown in FIG. 6 of the drawings.

As the partially exhausted roll 14 of toweling drops downwardly, the right-hand extremity thereof clears the supporting bearing 32 because of the inclined clearance face 62 provided thereon and the partially exhausted roll 14 assumes the auxiliary dispensing position on the auxiliary support 34, as best shown in FIG. 8 of the drawings. Of course, downward movement of the partially exhausted roll 14 also results in disengagement of the left-hand extremity of the core 36 from the cylindrical support bearing 38 on the movable support 30.

In this manner, the partially exhausted roll 14 of toweling is automatically dismounted from the associated support bearings 30 and 32 and caused to assume the auxiliary position of FIG. 8 of the drawings. Of course, the bearing receptacle can be located any distance from the center of the roll 14 and thus the time at which the roll 14 is considered sufficiently exhausted to permit it to be automatically dismounted from the supporting bearings 30 and 32 may be predetermined.

In any event, once the partially exhausted roll 14 has been automatically dismounted in the above described manner, a full replacement roll 74 may be installed upon the supporting bearings 30 and 32 by the custodian. Therefore, the removal of the partially exhausted roll 14 from the supporting bearings 30 and 32 is already accomplished and there is no necessity for the attendant to perform this task. In addition, the location of the partially exhausted roll 14 in the auxiliary dispensing position on the auxiliary support 34 constitutes an immediate indication to the custodian that a replacement roll 74 should be installed on the bearings 30 and 32. When installing the replacement roll 74 the custodian threads the depending length of toweling 16 between the roller 22 and the friction collars 26 to provide a double layer of toweling 16 until the partially exhausted roll 14 is completely exhausted. Individuals receiving the double layer of toweling will not normally attempt to obtain additional toweling from the dispenser 10 and thus the toweling from the partially exhausted roll 14 is efficaciously utilized. Fur-

5

thermore, the tendency of custodians to discard such partially exhausted rolls is completely obviated.

As a matter of fact, it is possible for successive partially exhausted rolls to be received on the auxiliary support 34 until the cores 36 thereof prevent a replacement roll 74 from being installed in the dispenser 10 which compels the custodian to remove the cores remaining in the dispenser 10 in order that the replacement roll 74 may be installed in the dispenser 10.

Therefore, by the utilization of the method of the invention, the pre-servicing of the dispenser 10 automatically takes place before the custodian opens the dispenser 10 to service the same.

Moreover, the utilization of the toweling on partially exhausted rolls, rather than the wastage thereof, is assured. Furthermore, an automatic indication of need for refilling the dispenser is provided because of the automatic location of the partially exhausted roll in the auxiliary dispensing position.

I claim:

1. In a method of automatically dismounting a partially consumed roll of strip material from a bearing member therefor, the steps of: forming a continuous receptacle in an end of the roll of material by removing a portion of the material adjacent the center of the roll; supporting said end of said roll by inserting said bearing member in said receptacle; and unreeling the strip of material from the roll until the strip has been consumed to a point adjacent said bearing member to release said end of said roll from said bearing member.

2. In a method of supporting a roll of strip material, the steps of: forming a bearing receptacle in the strip material at one end of the roll with the bearing wall of said receptacle constituted by said strip; inserting a bearing member in contact with said bearing wall; and consuming the strip material to the extent that said bearing wall is eliminated to permit said end to fall away from engagement with said bearing member.

3. In a method of automatically dismounting a partially consumed roll of strip material from engagement with a bearing, the steps of: forming a bearing receptacle in an extremity of said roll by displacing a portion of the material of said roll adjacent the center of the roll to provide a bearing surface in said receptacle constituted by said strip material; inserting said bearing into engagement with said bearing surface; and unreeling said strip material from said roll until said bearing surface is consumed to eliminate said receptacle and permit said end to fall from said bearing.

4. In a method of automatically dismounting a partially consumed roll of strip material from a bearing member therefor, the steps of: forming a bearing surface in an end of the roll of material at the point on said roll where the automatic dismounting thereof is desired; supporting said end of said roll by engaging said bearing member on said surface; and unreeling the strip of material from the roll until the strip has been consumed to a point adjacent said bearing member to destroy said surface and release said end of said roll from said bearing member.

5. In a method of supporting a roll of strip material so that said roll will be automatically dismounted from an associated bearing member at a predetermined point when it is partially consumed, the steps of: inserting said bearing member into a receptacle formed in said material at one end of said roll, said bearing member engaging a bearing wall constituted by said material; and unreeling said material until the portion thereof constituting said bearing wall has been consumed in order that said bearing member may be released from said receptacle and the roll of material automatically dismounted therefrom.

6. In a method of supporting a roll of strip material upon a bearing member so that said roll will be automatically dismounted from said bearing member when partially consumed, the steps of: forming a receptacle in an end of said roll which has a bearing surface constituted by

6

said material; inserting said bearing member in said receptacle in engagement with said bearing surface; and unreeling said material from said roll until the material constituting said bearing surface has been consumed, thus releasing said bearing member from engagement with said receptacle and permitting said roll to be automatically dismounted.

7. In a method of automatically dismounting a roll of strip material from operative engagement with an associated bearing member, the steps of: providing said roll with a receptacle at one end thereof constituted by a depression in said material, said depression having a bearing wall which is defined by adjacent layers of said material; inserting a bearing member in operative relationship with said bearing wall; and unreeling said material from said roll until the adjacent layers of materials constituting said bearing wall are consumed to eliminate the bearing relationship between said bearing member and said bearing wall and thus permitting the roll to be automatically dismounted from bearing relationship with said bearing member.

8. In a method for supporting a roll of material in strip form so that it may be automatically dismounted when the roll of material has been consumed to an extent that replacement thereof is indicated, the steps of: forming a receptacle in an end of the roll of material at the point on said roll where it has been consumed to such an extent that replacement thereof is indicated, said receptacle having a supporting wall defined by adjacent layers of material; placing a bearing member in said receptacle and in engagement with said supporting wall to support said end of said roll for rotation on said bearing member; and rotating said roll to release said material therefrom until the layers of material adjacent to said receptacle and constituting the supporting wall thereof are consumed, thus automatically releasing said end of said roll from operative relationship with said bearing member.

9. In a method for supporting a roll of strip material upon a bearing member so that it may automatically be discharged from operative relationship with said bearing member when the material on said roll has been consumed to an extent which would indicate the necessity for the replacement thereof, the steps of: deforming an end of the roll of material to define a bearing receptacle in said end having a bearing wall constituted by the material itself; engaging said bearing wall with said bearing member so that said bearing member will support said roll for rotation thereupon; and unreeling said strip material from said roll until it has been consumed to an extent which involves the consumption of the material defining said bearing wall so that said roll will automatically fall from operative engagement with said bearing member.

10. In a method of automatically releasing a roll of strip material from operative engagement with an associated bearing member so that said bearing member may be available for the disposition of a replaceable roll thereupon, the steps of: forming a bearing receptacle in the material at one end of said roll; inserting said bearing member in operative engagement with said receptacle; and unreeling said strip material from said roll until the material adjacent to and defining said receptacle in said end of said roll is consumed to permit said roll to be automatically released from operative engagement with said bearing member, thus exposing said bearing member for engagement by a replacement roll.

11. In a method of automatically locating a partially consumed roll of strip material in an auxiliary position in a dispenser for said material so that a replacement roll can be readily installed in said dispenser, the steps of: forming a bearing recess in the material at one end of the roll; engaging said bearing recess by a bearing member which will permit rotation of said roll to unreel said strip material therefrom; and unreeling said strip material until it is consumed to an extent sufficient to eliminate said recess thereby automatically releasing said roll from

operative engagement with said bearing member and permitting said roll to fall into the aforesaid auxiliary position.

12. In a method whereby a partially consumed roll of strip material may be automatically shifted from a first dispensing position to a second dispensing position, the steps of: forming a bearing surface in an end of said roll constituted by the material of said roll; engaging a bearing member upon said bearing surface to support said end of said roll; and unreeling said roll of strip material until

the material defining said bearing surface has been consumed thus permitting said end of said roll to be automatically released from operative engagement with said bearing member.

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