# United States Patent

[11] **3,570,731**


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[21] Appl. No. **827,564**
[22] Filed **May 26, 1969**
[45] Patented **Mar. 16, 1971**
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[54] **WHEELED SUPPORT FOR UPRIGHT ROLLS**
**8 Claims, 7 Drawing Figs.**


[52] **U.S. Cl.** ..... **225/38,**
225/67, 242/55.42, 242/55.54, 280/79.3
[51] **Int. Cl.** ..... **B26f 3/02**
[50] **Field of Search** ..... 280/79.3;
83/649, 650; 225/38, 69, 62, 66, 67 (X), 68, 69,
70, 71; 242/55.2, 55.42 (X), 55.54 (X); 211/44;
248/(Inquired)



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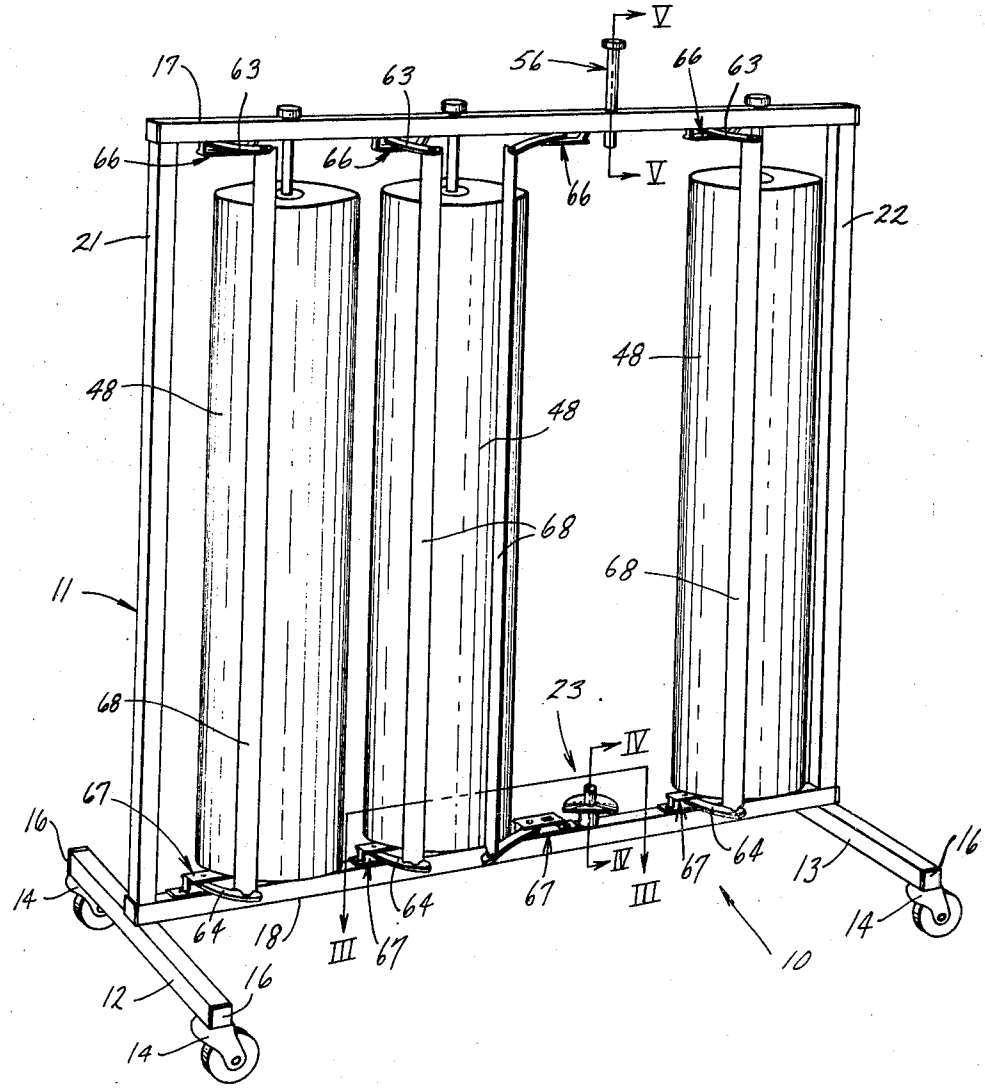
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**ABSTRACT:** A wheeled, upright frame having top and bottom members. The bottom member has a plurality of spaced upwardly extending spindles, each spindle being adapted to support the lower axial end of an upright roll and being spaced from the nearest portion of the top member a distance greater than the length of the roll. A plurality of upper spindles are slideably disposed within openings in the top member and coaxial with the lower spindles. A plurality of cutting bars are pivotally supported upon and extend between the top and bottom members for engagement with said rolls.

PATENTED MAR 16 1971

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SHEET 1 OF 2

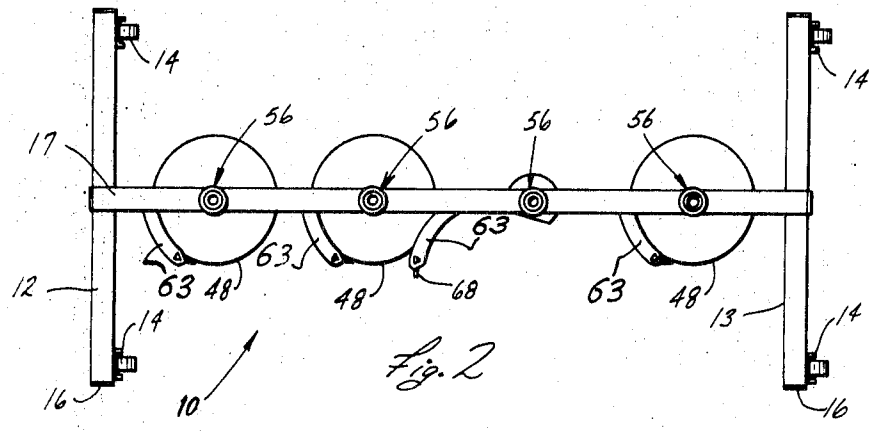



Fig. 2

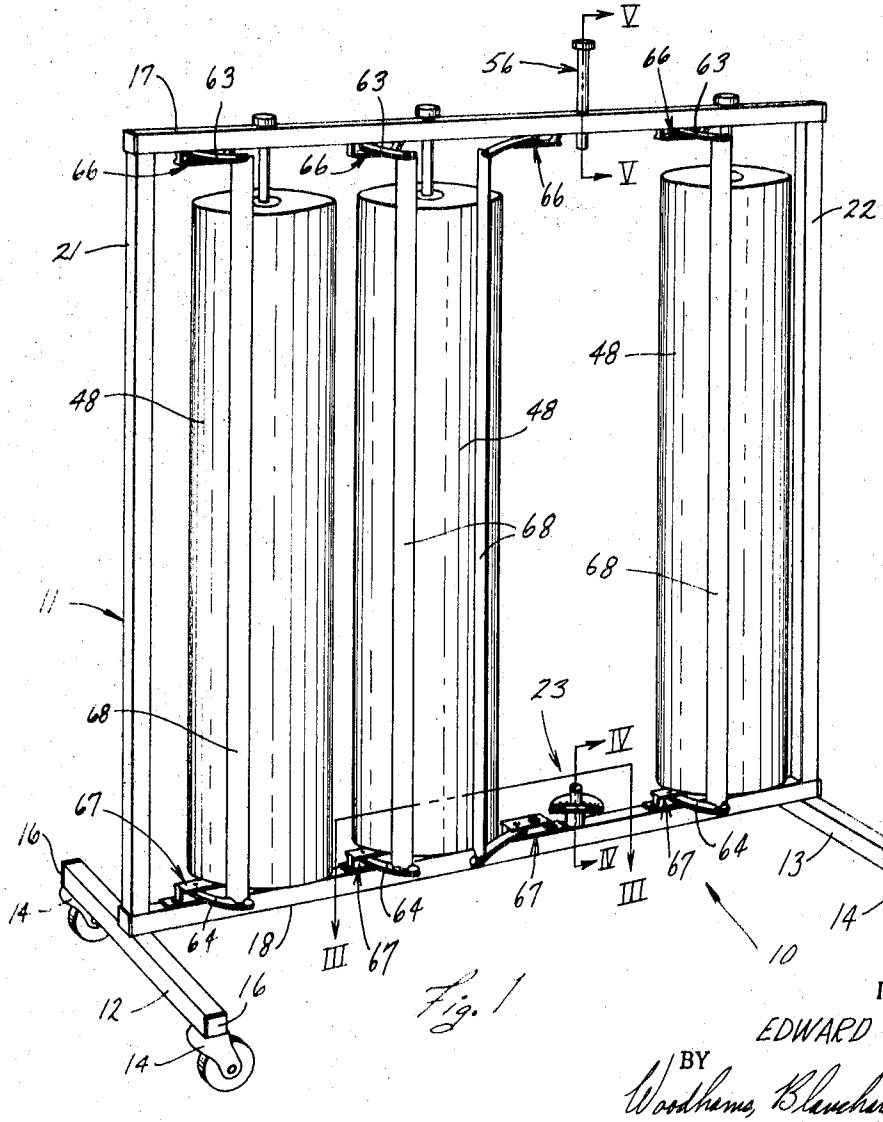



Fig. 1

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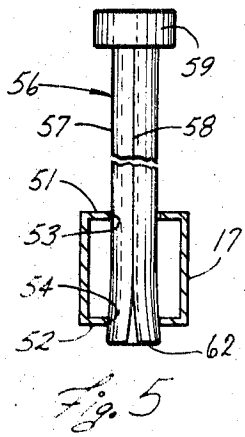



Fig. 5

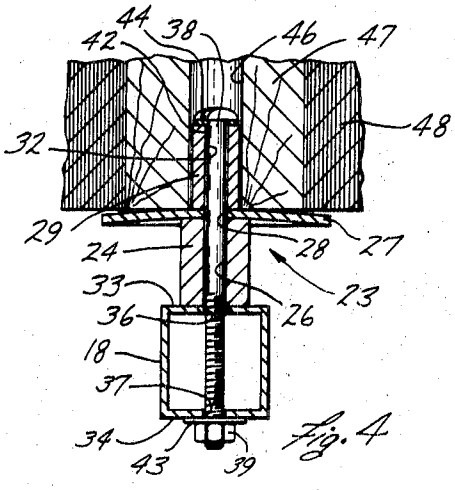



Fig. 4

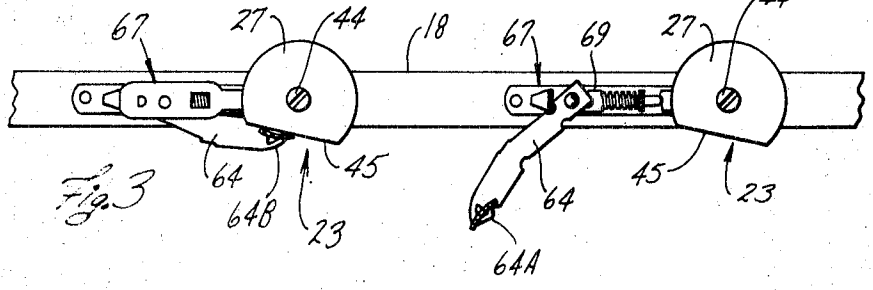



Fig. 3

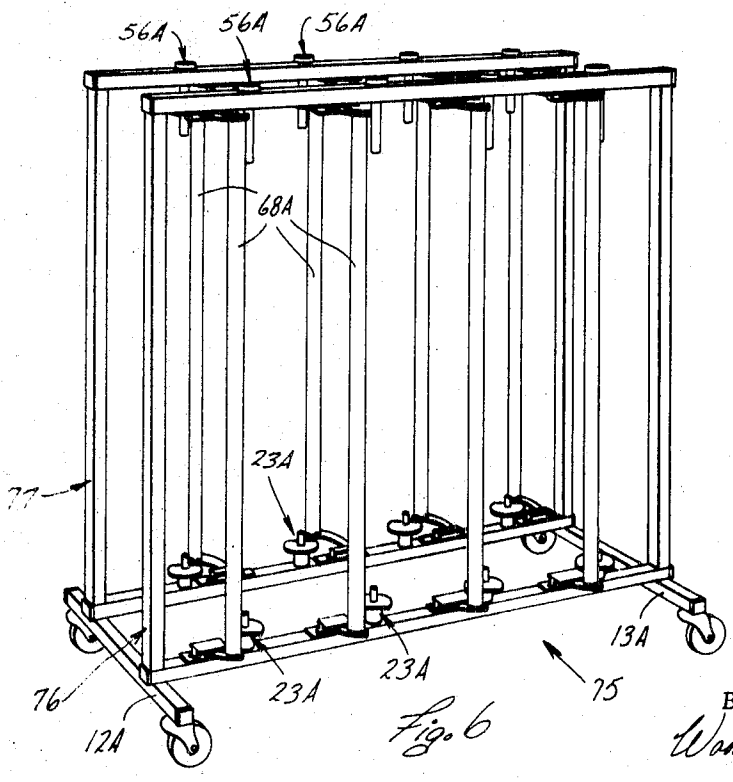



Fig. 6

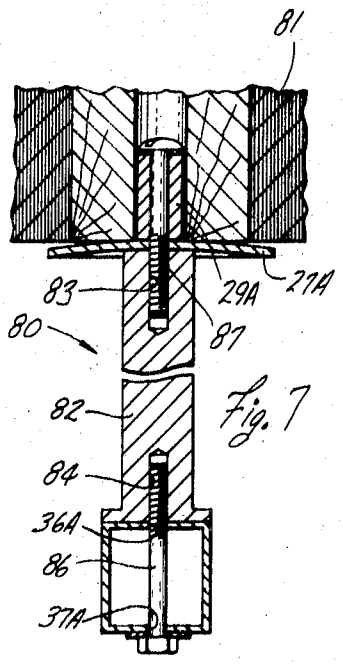



Fig. 7

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# WHEELED SUPPORT FOR UPRIGHT ROLLS

## BACKGROUND OF THE INVENTION

This invention relates in general to a wheeled support adapted to carry and dispense sheet material from plural rolls thereof mounted upon the support and, more particularly, to spindle structure for mounting said rolls upon the frame of the support.

Persons acquainted with the manufacture and use of equipment for supporting rolls of sheet material and dispensing the material from the rolls have long recognized the problems of loading relatively large rolls of sheet material onto the frame of the dispenser and providing plural rolls in positions from which the sheet material can be readily dispensed even by small children. In particular, but not as a limitation, rolled paper dispensers are widely used in educational institutions, particularly in the lower grades. Because of the demands for space, wheeled supports are usually provided for the rolls and dispensers, but the rolls are normally arranged with their axes in horizontal positions, usually stacked one above the other. As a result, the uppermost rolls are difficult for small children to reach, and it is even more difficult for the children to operate the paper-dispensing mechanism associated therewith. On the other hand, the lowermost rolls are in an awkward position for the teacher. Furthermore, and of equal importance, it is difficult to load relatively large rolls of paper, such as those which are more than 2 feet long and 6" in diameter, upon such racks in horizontal positions. Usually, the loading operation requires at least two adults, primarily because of the difficulty of gripping the roll while it is being loaded.

The cores used in rolls of paper vary somewhat in diameter and, where the core is relatively small, it is necessary to provide a lower support for an upright roll which will not interfere with dispensing the radially innermost end of the sheet material. Yet, the lower spindle must be of sufficient diameter that it will provide adequate axial support for the roll which often weighs substantially in excess of 25 pounds.

Accordingly, a primary object of this invention is the provision of a wheeled support for plural, axially upright rolls of sheet material wherein relatively large rolls can be readily mounted upon the rack, one at a time, by an individual adult person, and all of the paper on each roll can be dispensed.

A further object of this invention is the provision of a rolled paper support, as aforesaid, having spaced upper and lower spindles, the upper spindle being arranged to releasably support itself in a raised position when a roll of sheet material is being loaded upon the lower spindle. Other objects and purposes of this invention will become apparent to persons familiar with this type of equipment upon reading the following descriptive material and examining the accompanying drawings, in which:

FIG. 1 is a perspective view of a wheeled support embodying the invention and showing plural rolls of sheet material mounted thereon.

FIG. 2 is a top plan view of said wheeled support with said rolls of sheet material.

FIG. 3 is a broken, sectional view taken along the line III–III in FIG. 1 with the rolled sheet material removed.

FIG. 4 is a sectional view taken along the line IV–IV in FIG. 1.

FIG. 5 is a sectional view taken along the line V–V in FIG. 1.

FIG. 6 is modified wheel support adapted to hold two rows of rolled sheet material.

FIG. 7 is a sectional view similar to that taken along the line IV–IV in FIG. 1, but illustrating a modified lower spindle. For convenience in description, the terms "upper," "lower" and words of similar import will have reference to the wheel support of the invention or parts thereof as appearing in FIGS. 1 and 6. The terms "inner," "outer" and derivatives thereof will have reference to the geometric center of the wheel support and parts thereof.



## SUMMARY OF THE INVENTION

The objects and purposes of the invention, including those set forth above, have been met by providing a wheeled, upright frame having spaced, aligned and interconnected top and bottom members. A plurality of lower spindles are mounted upon the bottom member to support and position the lower axial ends of upright rolls of sheet material. The upper axial ends of the rolls are releasably engaged by upper spindles slideably supported upon the top member. Each upper spindle can be releasably held in the raised position while a roll is being loaded upon its corresponding lower spindle. A cutter bar is mounted upon the frame for use in dispensing the sheet material from each roll.

## DETAILED DESCRIPTION

The roll support **10**, one preferred embodiment of which is illustrated in FIG. **1**, is comprised of an upright, substantially rectangular frame **11** mounted upon a pair of parallel crossbars **12** and **13**, all of which are preferably fabricated from hollow metal tubing having a rectangular cross section. Casters **14** are pivotally connected to and support the opposite ends of the two crossbars **12** and **13**. Caps **16** are secured to and cover the opposite ends of the crossbars **12** and **13**.

The frame **11** (FIG. **1**) has spaced, parallel and substantially horizontal top and bottom members **17** and **18**, respectively. A pair of spaced and parallel upright members **21** and **22** extend between and are rigidly secured to the two corresponding ends of the top member **17** and bottom member **18**.

A plurality of lower spindles **23** are preferably mounted at uniform and spaced intervals along said bottom member **18** (FIG. **3**). Each spindle **23** (FIG. **4**) is comprised of a spacer **24** which rests upon the upper side **33** of the bottom member **18** and has a vertical opening **26** therethrough. A substantially horizontal and substantially circular plate **27** is supported upon the spacer **24** and has an opening **28** preferably of about the same diameter as, and aligned with, the opening **26**.

A sleeve **29** (FIG. **4**) is supported upon the plate **27** and has a central opening **32** which is also of about the same size as, and coaxial with, the opening **26**. The upper and lower sides **33** and **34** of the bottom member **18** have openings **36** and **37**, respectively, which are preferably of about the same diameter as the opening **26** and coaxially alignable therewith. A round headed screw **38** is snugly but slideably inserted through the openings **32**, **28**, **26**, **36** and **37**, and the lower threaded end of the screw **38** is engaged by a nut **39** whereby said screw and nut hold the assembly of sleeve **29**, plate **27** and spacer **24** rigidly upon the bottom member **18**. Washers **42** and **43** encircle the screw **38** adjacent the head **44** thereof and the nut **39**, respectively, for conventional purposes.

The plate **27** is preferably cupped slightly with its concave side facing downwardly. Thus, when the sleeve **29** is disposed within the opening **46** in the core **47** of the paper roll **48**, said roll is supported by engagement between the core **47** and that portion of the plate **27** adjacent the opening **28** therein. This arrangement minimizes frictional drag when the roll **48** is rotated during the process of dispensing the sheet material therefrom. The round head **44** on the screw **38** facilitates insertion of the upper end of the spindle **23** into the opening **46** in the core **47**.

The plate **27** has one substantially straight edge **45** which is of reduced radial extent and preferably extends along a chord of the circle defined by the remainder of the outer edge of the plate **27**. The purpose of this edge **45** will appear hereinafter.

The upper and lower sides **51** and **52** (FIG. **5**) of the top member **17** have a plurality of openings **53** and **54**, respectively, which are arranged in vertically aligned pairs, and each pair is in vertical alignment with the axis of a lower spindle **23** (FIG. **1**). An upper spindle **56** is slideably disposed within each pair of openings **53** and **54** in axial alignment with a lower spindle **23**.

The upper spindle **56** (FIG. **5**) is comprised of an elongated tube **57** with a seam **58** extending lengthwise thereof. The tube **57** is preferably substantially cylindrical and is secured at its

upper end to a knob 59 which extends laterally substantially beyond the peripheral surface of the tube 57 and is substantially larger than the opening 53 in the upper side 51. Thus, the knob 59 positively limits downward movement of the upper spindle 56 when said knob engages the upper side 51 of the top member 17.

The lower end 62 of the tube 57 diverges slightly downwardly so that the lowermost end of the tube 57 has a diameter slightly larger than the diameter of the opening 54 in the lower side 52. This divergence can be accomplished merely by placing a wedge into the lower end of the seam 58 and spreading those parts of the lower end 62 adjacent the seam 58. The upper spindle 56 is preferably fabricated from metal and the wall thickness of the tube 57 is such that the lower end 62 will flex inwardly when the spindle is raised to its wedged position of FIG. 5. Yet, the tube 57 has sufficient strength to oppose substantial lateral forces when it is in its operating position within the upper end of the opening 46 in the core 47 of a roll of paper 48.

A pair of arms 63 and 64 (FIG. 1) are pivotally supported at one end of each upon bracket assemblies 66 and 67, respectively, which in turn are mounted upon the opposing sides 52 and 33, respectively, of the top and bottom members 17 and 18. Each pair of bracket assemblies 66 and 67 is located adjacent a pair of upper and lower spindles 56 and 23, respectively, and said assemblies 66 and 67 may be mirror images of each other. A cutter bar 68 is pivotally engaged at its upper and lower ends by the arms 63 and 64.

The bracket assemblies 66 and 67 and their associated arms 63 and 64 may be substantially identical with the corresponding parts disclosed in either of the two U.S. Pats. No. 2,473,744 and No. 2,559,937, both issued to Elvah O. Bulman. Each arm 64 (FIG. 3), for example, is engaged by a spring-biased toggle mechanism 69 which can hold the arm in a fully open position 64A or continuously urge said arm from an open position toward the closed position of 64B.

The straight edge 45 is positioned so that it is substantially perpendicular to a tangent of the arc of swing of the arm 64 as the arm approaches engagement with the edge 45. Thus, the cutter bar 68 is permitted to move close enough to the axis of the spindle 23 to dispense the entire roll of paper without materially reducing the strength of the plate 27.

## MODIFIED STRUCTURES

The roll support 75 (FIG. 6) differs from the roll support 10 in that the roll support 75 has a pair of upright frames 76 and 77 rigidly supported in spaced, parallel relationship upon a pair of crossbars 12A and 13A. The lower spindles 23A and upper spindles 56A, which are supported on the frames 76 and 77, may be identical with the spindles 23 and 56, respectively, described above. Likewise, the cutter bars 68A and their supporting arms and bracket assemblies may also be identical with those described above with respect to the structure disclosed in FIG 1.

It will be apparent from the foregoing disclosure that roll supports having varying numbers of pairs of upper and lower spindles and either one or two upright frames may be provided within the scope of the invention.

FIG. 7 illustrates a modified lower spindle adapted to replace one of the lower spindles in the frame 11, for example, to accommodate a roll 81 which has a shorter, axial length than the other rolls 48 disposed within the frame 11.

Specifically, the spindle 80 has an elongated spacer 82 with tapped, lengthwise openings 83 and 84 in the upper and lower ends, respectively, thereof. A bolt 86 extends upwardly through the openings 36A and 37A and is threadedly received into the opening 84. A plate 27A and sleeve 29A are secured to the upper end of the spacer 82 by a screw 87 which extends through the sleeve 29A and plate 27A and is threadedly engaged within the opening 83. Thus, by appropriate selection of the length of the spacer 82, rolls of substantially different axial extent can be accommodated.

## OPERATION

While persons skilled in this field will understand the operation of the roll support 10 from the foregoing description, such operation will be briefly summarized.

The lower spindles 23 (FIG. 1) are mounted upon the bottom member 18 so that the straight edge 45 on each plate 27 is in the above-described position with respect to the closed cutter bar 68. The upper spindles 56 are inserted through the openings in the top member 17 after which the lower end of the seam 56 in each tube 57 is spread to provide the enlarged lower end. The cutter bars 68 are then moved into the open positions, as indicated by the location of the arm 64A in FIG. 3, and the upper spindles 56 are moved into their raised position of FIG. 5. The described positions of the upper and lower spindles and the cutter bars are shown at the roll position second from the right in FIG. 1.

A roll 48 of paper is now arranged in an upright position adjacent the frame 11 after which its lower end is placed upon the lower spindle 23 so that the sleeve 29 extends into the core of the roll. The upper end of the roll is then moved toward the frame until the lower end of the upper spindle 56 can move downwardly into the core. The spindle 56 can be easily tapped loose from its wedged, raised position. The cutter bar 68 is then moved into position against the periphery of the roll and paper from the thusly mounted roll can now be dispensed.

Removal of an empty core can be effected by simply reversing the above-described procedure, after which a new roll can be placed in position as heretofore described.

Operation of the roll support 75 disclosed in FIG. 6 would be identical with that described above with respect to the roll support 10, except that the roll support of FIG. 6 can carry twice as many rolls of paper.

Although particular preferred embodiments of the invention have been disclosed in detail for illustrative purposes, it will be recognized that variations or modifications of the disclosed apparatus, including the rearrangement of parts, lie within the scope of the present invention.

We claim:

1. A device for supporting a roll of sheet material in an axially vertical position and for dispensing portions of said material from the said roll, comprising:

frame means including a bottom member, a top member and interconnecting structure extending between and rigidly secured to said bottom member and said top member;

lower spindle means mounted upon the bottom member and projecting upwardly therefrom for engaging and supporting said roll of sheet material;

means defining a vertical opening through said top member coaxially aligned with the upright axis of said lower spindle, the distance between the upper end of said lower spindle and the lower side of the top member around said opening being greater than the length of the roll of sheet material; and

an elongated upper spindle axially slideably disposed within said opening in said top member and having an enlargement spaced substantially from its lower end for positively limiting downward movement of said upper spindle through said opening, said upper spindle having a downwardly diverging portion spaced downwardly from said enlargement, the lower end of said diverging portion being larger than the diameter of said opening, whereby upward movement of said upper spindle beyond a predetermined distance wedges said upper spindle with respect to said top member.

2. A device according to claim 1, including upper and lower arms pivotally supported upon said top member and bottom member, respectively, adjacent said spindles; and a cutter bar pivotally connected at its upper and lower ends to said arms and adapted to engage said roll.

3. A device according to claim 2, having an H-shaped base including said bottom member; and four casters mounted at and supporting the four corners of the base.

4. A device according to claim 2, wherein said lower spindle means comprises a substantially circular and horizontal support plate coaxial with said axis of said lower spindle means and spaced from the upper end thereof, said plate having a portion of reduced radial extend on the side thereof adjacent said cutting blade, whereby said cutting blade can move close to said axis.

5. A device according to claim 3, including plural pairs of upper and lower spindles having vertical axes disposed substantially within a single plane; and plural cutter bars, each thereof being operable with a roll supported by a pair of upper and lower spindles.

6. A device according to claim 5, including plural pairs of upper and lower spindles arranged in a second plane parallel with and spaced from said first plane; and cutter bars associated with said spindles in said second plane.

7. A device for supporting a plurality of relatively large and axially vertical rolls comprising:

a substantially rectangular base frame including a bottom member;

a top member vertically aligned with said bottom member, and upright members extending between and rigidly connected to said top member and said bottom member;

a plurality of axially vertical lower spindles nonrotatably mounted upon said bottom member, each lower spindle having an integral, concentric and substantially circular flange spaced from the upper end thereof, and each flange having a portion of reduced radial extent on one side thereof;

plural upper spindles vertically slideably supported upon said top member, each upper spindle having upper and lower enlarged portions preventing accidental disengagement thereof from said top member, and each upper spindle being coaxial with a lower spindle, the distance between each pair of upper and lower spindles, when said upper spindle is in its uppermost position, being greater than the axial length of a roll of sheet material to be supported therebetween;

plural pairs of arms pivotally supported upon said top member and said base member, one pair of arms being adjacent each pair of upper and lower spindles;

a cutter bar mounted upon and extending between each pair of upper and lower arms, said bar being positioned so that it will engage said portion of reduced radius on said flange means when the roll of sheet material is removed therefrom; and

casters connected to and supporting the four corners of said base frame.

8. A device according to claim 7, wherein said upper spindles have substantially cylindrical central portions and downwardly diverging lower portions; and

wherein said upper member has a plurality of vertical openings, one upper spindle being disposed within each of said openings, and the diameter of each opening being smaller than the diameter of the lower end of the upper spindle disposed therein, whereby upward movement of each upper spindle means beyond a selected point wedges said upper spindle with respect to said top member.