United States Patent

[11] 3,567,146

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[54] **END CORE FOR ROLLS OF PAPER**
8 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **242/68.6,** 206/59
[51] **Int. Cl.** **B65h 75/02**
[50] **Field of Search** ..... 242/68.6, 118.61, 68.5; 206/59 (F), 59 (M), 59 (E), 59 (A), 59 (B)

[56] **References Cited**

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ABSTRACT: An end core for mounting in opposite ends of a roll of paper for rotatably supporting same has concentric inner and outer substantially cylindrical walls connected at one end by an end wall with a portion extending beyond the outer wall to form an annular flange. The end wall, flange and inner and outer walls have a radial slot extending longitudinally of the core. Reinforcing members are circumferentially spaced and extend radially between the inner and outer core walls with a pair of the reinforcing members being in facing relation with facing surfaces aligned with the slot. The core structure and slot permit contraction for insertion into a roll of paper and then expansion of the core into tight engagement with the inner convolution of the paper roll.

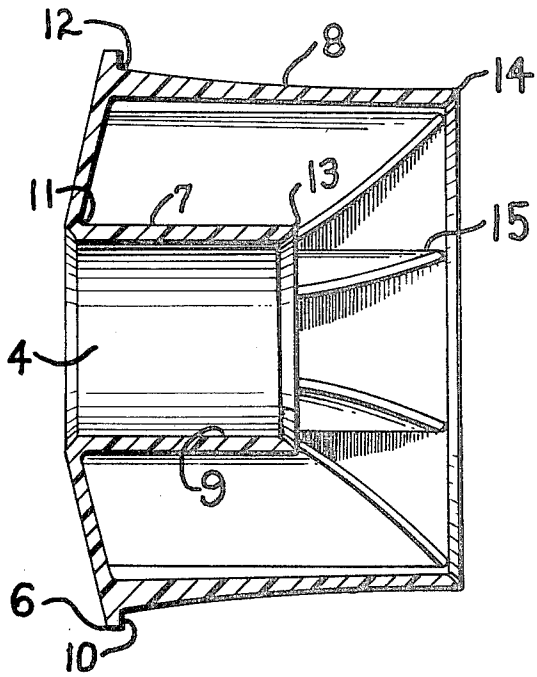


Fig. 2.

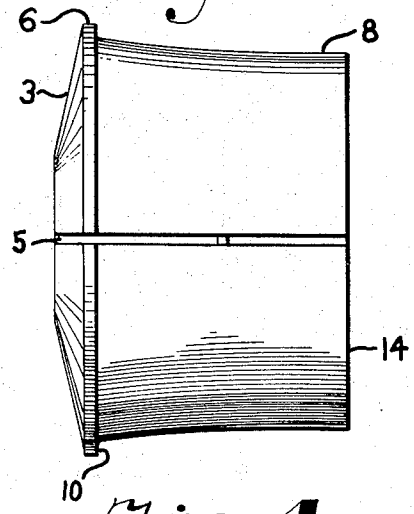


Fig. 1.

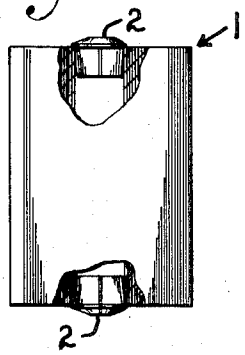


Fig. 3.

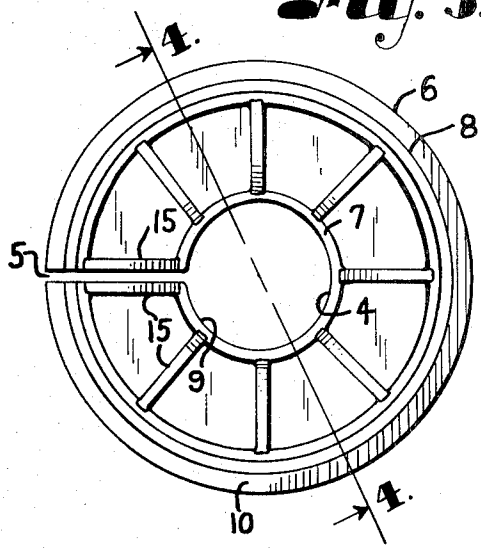


Fig. 4.

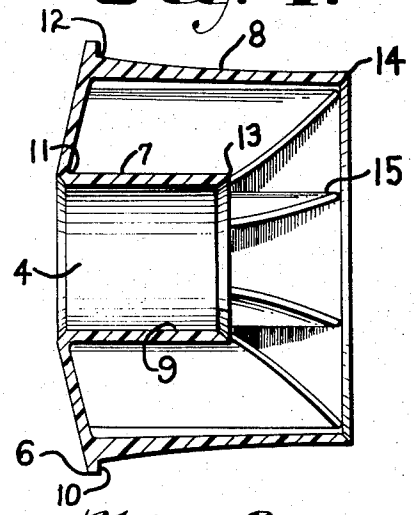


Fig. 5.

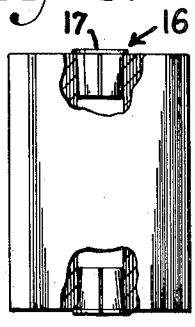
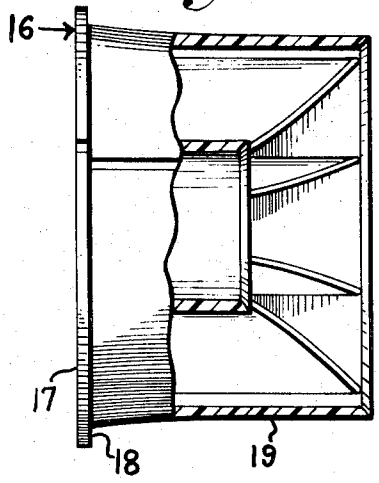


Fig. 6.



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END CORE FOR ROLLS OF PAPER

The present invention relates to end cores for rolls of paper and more particularly to an end core adapted to maintain inner layers of the roll of paper in tension and rotatably support same.

The principal objects of the present invention are: to provide an end core for mounting in opposite ends of a roll of paper and resiliently engaging same for rotatably supporting same; to provide such an end core adapted to maintain inner layers of the roll of paper in tension; to provide such an end core adapted to be maintained in compression when installed in one end of the roll of paper; to provide such an end core having an end wall adapted to engage one end of the roll of paper and an outer core wall adapted to maintain positive engagement with the inner layer of the roll of paper; to provide such an end core having a crowned end wall adapted to serve as a bearing for rotatably supporting a vertical roll of paper for dispensing therefrom; and to provide such an end core which is economical to manufacture, easily installed in rolls of paper, and particularly well suited for the proposed use.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG 1 is an elevational view of a vertical roll of paper having end cores therein which embody features of the present invention.

FIG 2 is an enlarged side elevational view of one of the end cores.

FIG 3 is an enlarged end elevational view of the end core.

FIG 4 is a longitudinal sectional view taken on line 4–4, FIG 3.

FIG 5 is an elevational view of a vertical roll of paper having a modified end core in each end thereof.

FIG 6 is an enlarged side elevational view of the modified end core.

Referring more in detail to the drawings:

The reference numeral 1 generally designates a hollow roll of paper having an end core 2 placed in opposite ends thereof for rotatably supporting the roll of paper 1.

The end core 2 has a generally annular end wall 3 having an inner peripheral edge 4 forming a centrally positioned circular aperture therein. An elongated slot 5 extends radially between the inner peripheral edge 4 and an outer peripheral edge 6 of the end wall 3, thereby defining opposite ends of the end wall 3.

Concentric inner and outer core walls 7 and 8, respectively, are connected to and extend from the end wall 3. The outer core wall 8 is normally of a size slightly larger than the interior size of the hollow roll of paper 1 which is adapted to receive the end core 2 therein. An inner periphery or inner surface 9 of the inner core wall 7 registers with the inner peripheral edge 4 of the end wall 3 and the outer core wall 8 is positioned adjacent the outer peripheral edge 6 of the end wall 3 defining a lip or annular flange 10 extending substantially radially outwardly from the outer core wall 8 for engaging an end of the roll of paper 1. The inner and outer core walls 7 and 8 each have fixed ends 11 and 12, respectively, connected to the end wall 3 and free ends 13 and 14, respectively. End edges of the inner and outer core walls 7 and 8 terminate at the slot 5 in the end wall 3 thereby defining longitudinal slots through the core walls which extend longitudinally for the length thereof.

Reinforcement members 15 are circumferentially spaced and extend radially between the inner and outer core walls 7 and 8, with a pair of the reinforcing members 15 being in facing relation with facing surfaces aligned with the slot 5 thereby defining an elongated radial slot through the end core 2. The radial slot extends longitudinally for the length of the inner and outer core walls 7 and 8 thereby permitting the facing reinforcing members 15 to move toward and away from each other to vary the exterior diameter of the end core 2.

The end wall 3 forms an acute angle with the longitudinal axis of the end core 2 whereby the inner peripheral edge 4 of the end wall 3 is outwardly of a plane extending through the outer peripheral edge 6 and normal to the inner and outer core walls 7 and 8.

When the roll of paper 1 is placed in a vertically standing position, the end core 2 will support the weight of the roll of paper 1 on the end wall 3 and the inner core wall 7. Paper may be dispensed from the roll of paper 1 with the end core 2 functioning as a bearing member for rotatably supporting the roll of paper 1.

The inner peripheral surface of the outer core wall 8 is spaced at a constant radius from the longitudinal axis of the end core 2 and the thickness of the outer core wall 8 gradually reduces from the fixed end 12 to the free end 14 and the outer core wall 8, therefore, has a greater exterior diameter at the fixed end 12 than at the free end 14. Placing the end core 2 in one end of the roll of paper 1 moves the facing reinforcing members 15 toward each other, thereby reducing the transverse dimension of the slot 5 and the spacing between the facing reinforcing members 15.

The end core 2 is formed of a suitable resilient material, whereby the end core 2 attempts to regain its original shape, thereby placing the inner layer of the roll of paper 1 in tension through frictional engagement between the exterior surface of the outer core wall 8 and the inner layers of paper.

In use, the outer core wall 8 is squeezed thereby reducing the diameter thereof prior to placing the end core 2 in the hollow roll of paper 1. The normal or relaxed exterior diameter of the outer core wall 8 is slightly larger than the interior diameter of the hollow roll of paper 1, therefore, when the end core 2 is within the roll of paper 1, the end core 2 will be maintained in compression and the inner layers of paper will be placed in tension. The roll of paper 1 may be rotatably mounted in a horizontal position by extending an elongated shaft or rod (not shown) through the end cores 2 placed therein. When the roll of paper 1 is vertical and supported on the end core 2, the end wall 3 will serve as a bearing for rotating the roll of paper for dispensing paper therefrom.

FIG 6 illustrates a modified end core 16 having a generally planar end wall 17, whereby rolls of paper having the modified end core 16 in opposite ends thereof may be stacked vertically. The modified end core 16 also has an annular flange 18 which extends radially outwardly from an outer core wall 19 for engaging an end of the roll of paper, whereby the end wall 17 is positioned outwardly of the end of the respective roll of paper, thereby permitting the roll of paper 1 to be rotated on the modified end core 16 as a bearing.

It is to be understood that while I have illustrated and described certain forms of my invention, it is not to be limited to these specific forms or arrangement of parts herein described and shown.

I claim:

1. An end core for application to a hollow roll of paper comprising:

a. concentric inner and outer generally cylindrical walls, said outer wall normally being of a size slightly larger than the interior size of a hollow roll of paper adapted to receive same;

b. an end wall connecting one end of each of said inner and outer concentric walls and extending outwardly of the outer wall in an annular flange for engaging the end of a roll of paper;

c. a radial slot through said end wall and an elongated slot through said inner and outer concentric walls, said elongated slots through said inner and outer concentric walls extending longitudinally for the length thereof; and

d. a plurality of circumferentially spaced reinforcing ribs connecting said inner and outer walls with a rib on each side of said slot.

2. The end core as set forth in claim 1 wherein:

a. said end wall is substantially normal to said inner and outer concentric walls; and

b. said end wall is a generally planar member whereby rolls of paper having the end core in opposite ends thereof may be stacked vertically.

3. The end core as set forth in claim 1 wherein:

a. said end wall is positioned to form an acute angle with the longitudinal axis of said inner and outer concentric walls; and

b. said inner wall has an inner periphery thereof in registry with an inner edge of said end wall whereby said end wall and inner wall support a vertically standing roll of paper and said roll of paper turns on the end core as a bearing.

4. The end core as set forth in claim 3 wherein; said outer wall has a greater exterior diameter at a fixed end mounted on said end wall than at a free end whereby said facing reinforcing ribs are urged toward each other upon placing the end core in one end of a roll of paper thereby maintaining the end core in compression and the inner layers of paper in tension.

5. The end core as set forth in claim 3 wherein; said outer wall has a gradually reducing thickness from a fixed end mounted on said end wall toward a free end whereby said facing reinforcing members are urged toward each other upon placing the end core in one end of a roll of paper thereby maintaining the end core in compression and the inner layers of paper in tension.

6. An end core for application to a hollow roll of paper comprising:

a. concentric inner and outer core walls, said inner and outer core walls being generally cylindrical walls, said outer core wall normally being of a size slightly larger than an interior size of a hollow roll of paper adapted to receive same;

b. an end wall connecting one end of said inner and outer core walls;

c. a slot extending radially through said end wall;

d. a slot extending longitudinally through said inner and outer core walls, said slots through said inner and outer core walls being aligned with said slot through said end wall; and

e. a plurality of reinforcing members connecting said inner and outer core walls for maintaining said core walls substantially concentric.

7. The end core as set forth in claim 6 wherein:

a. said reinforcing members are circumferentially spaced planar ribs extending radially between said inner and outer core walls; and

b. a pair of said reinforcing members are positioned with facing surfaces aligned with said slots through said inner and outer core walls.

8. The end core as set forth in claim 7 wherein; said outer wall is positioned radially inwardly from the outer peripheral edge of said end wall thereby forming a lip for engaging an end of a roll of paper having the end core therein.