

Nov. 27, 1956

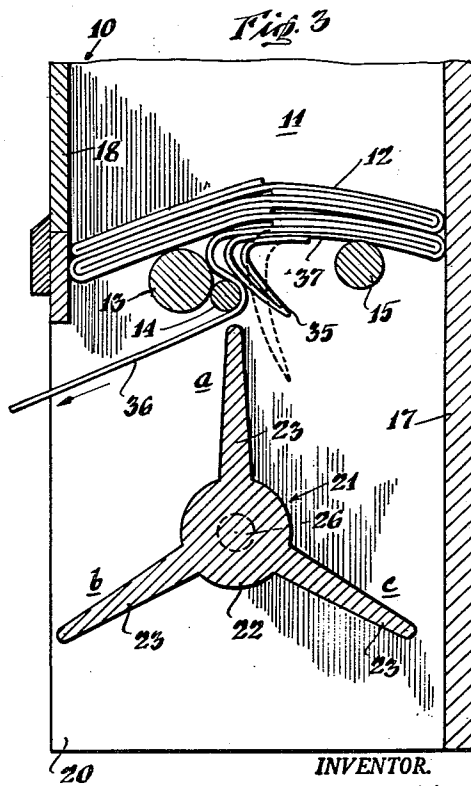
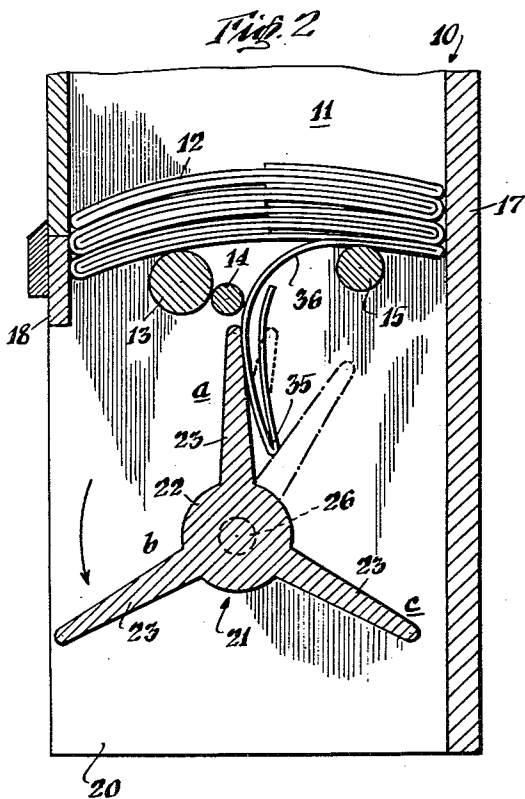
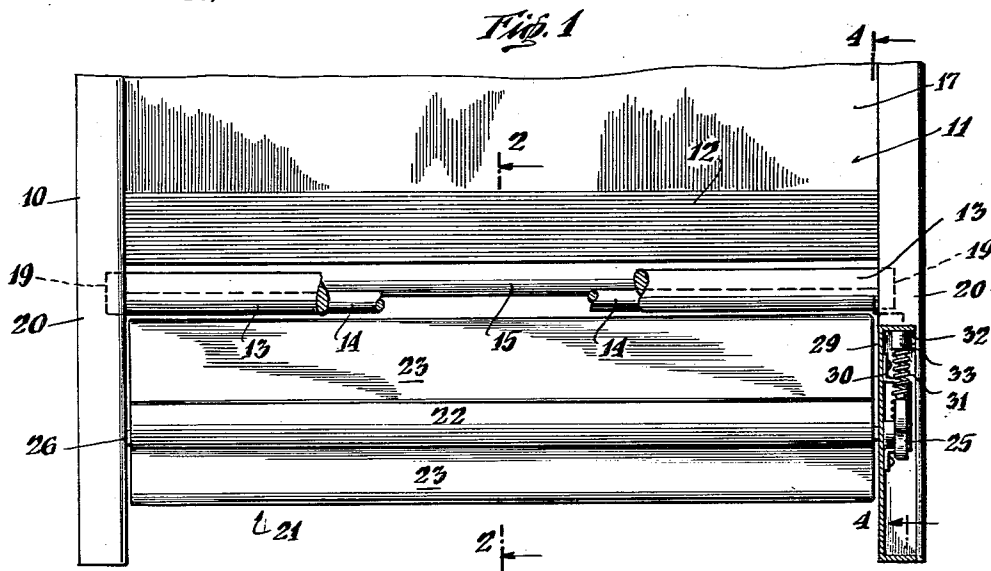
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2,772,021

TOWEL DISPENSING DEVICE

Filed Jan. 16, 1952

2 Sheets-Sheet 1



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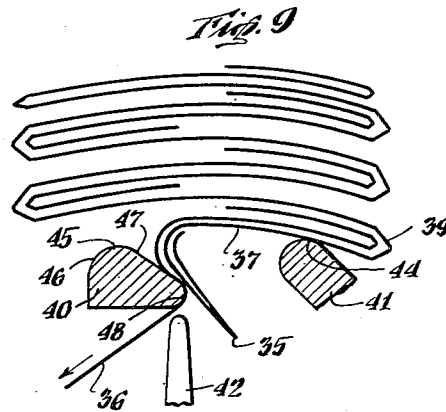
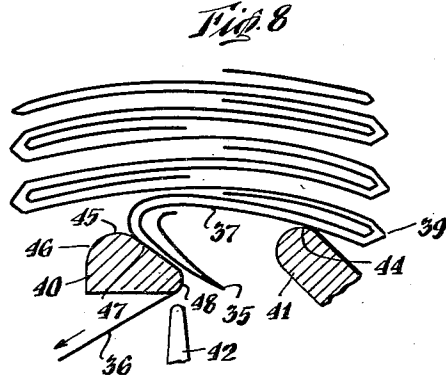
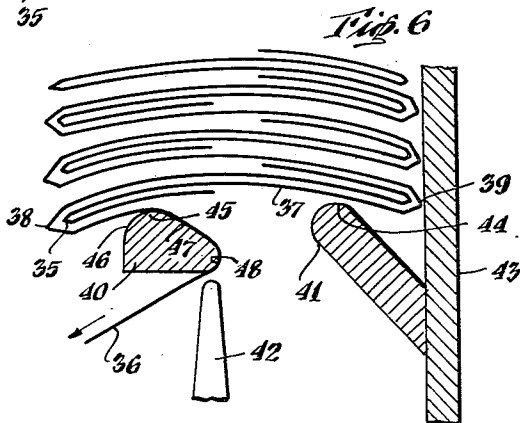
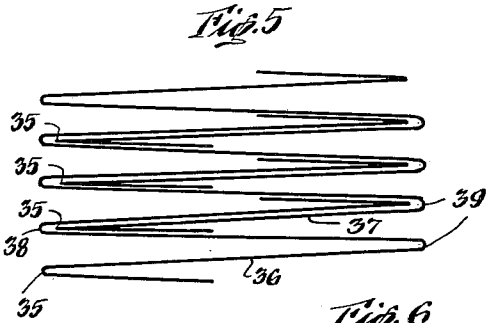
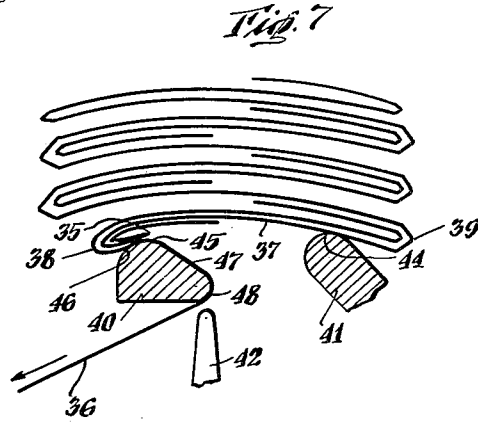
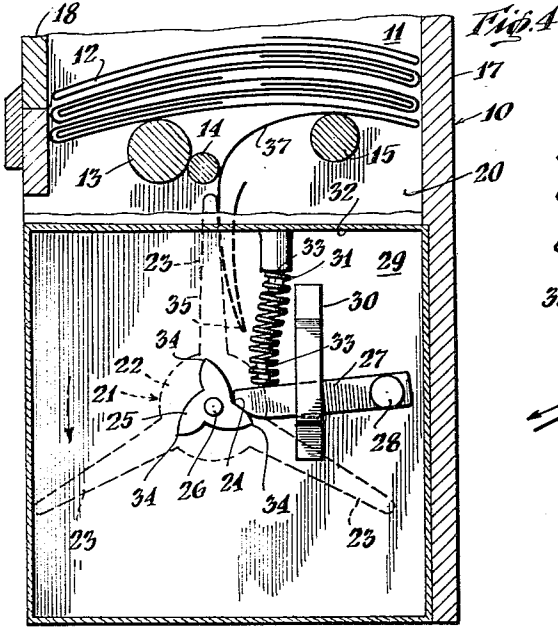
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TOWEL DISPENSING DEVICE

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2 Sheets-Sheet 2



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TOWEL DISPENSING DEVICE

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3 Claims. (Cl. 221—38)

This invention relates to an improved towel dispensing device, particularly to an apparatus for dispensing singly multifolded paper towels.

In Patent No. 2,188,660, which was issued to me, there is disclosed a dispensing apparatus in which access to the outlet at the lowermost end of the towel supply magazine is blocked by a displaceable barrier which comprises a vertically disposed blade of a member having a spider-shaped transverse section. The blade can be displaced toward the user to permit access to the towel depending from the magazine outlet. The spider-shaped member is arranged so that another blade of said member replaces the first mentioned blade after the latter is displaced toward the user. This device is for the purpose of requiring the user to operate the spider-shaped member to obtain each towel and thereby prevent the withdrawal of more than one towel at a time, without operating the spider-shaped member. The towel which is caused to follow the lead or depending towel is intended to fall behind the second blade of the spider member which comes into position in front of the outlet when the first mentioned blade is moved toward the user.

Because of the manner in which the towels have been supported, the folded ends of the following towels have tended to extend diagonally downward and forward as they were drawn from the outlet. With the ends extended in this direction they might be caused to follow the towel being withdrawn between the adjacent portions of the blocking blade member and the lower part of the outlet instead of falling behind the blade. This undesirable tendency to follow was increased by adhesion between adjacent towels.

In order to break down the adhesion between the adjacent towels and to insure that the towel following the one grasped by the user falls behind the vertical blade of the spider-shaped barrier, it has been found that if the towels in the magazine are supported along parallel lines adjacent to the outlet, the towels will be formed by their weight and by the supporting members to define a concave curve in which the folded edges of the towels are lowermost.

With this improved support arrangement, the leading folded edge of the following towel, as it is withdrawn, will be curved away from the vertical blade of the spider-shaped impeller and therefore will not tend to follow the lead towel between the blade and the lowermost part of the outlet.

It will be understood, therefore, that an important object of this invention is to provide an improved support means for a towel dispenser whereby a curve is imparted to the leading edge of a following towel so that it is directed away from the direction the towel being withdrawn is pulled, and whereby the adhesion between the adjacent interfolded towels is broken.

The improved towel supporting means of this invention includes parallel members disposed at the bottom of a towel magazine. The parallel members engage and support the lowermost towel along two lines spaced inwardly

from and substantially parallel to the folded edges of the said towel. The supporting members are also spaced apart to define an outlet through which the towels may be withdrawn. The supporting members impart a downwardly disposed concave form to the towels whereby the leading folded edges of successive following towels are caused to bend back under themselves as the leading towel, with which they are interfolded, is withdrawn up and over one of the supporting members. As a result of the concave form imparted to each towel and the bending of the towel near its leading edge as the leading towel is withdrawn, the towel is formed so that it moves out of the outlet in a direction curving away from the leading towel being withdrawn.

For a more complete description of the invention, reference is made to the drawings wherein:

Figure 1 is a front view of the lower portion of a towel dispensing device embodying the improved towel supporting means of this invention;

Figs. 2 and 3 are vertical cross-sectional views of the device taken along the lines 2—2 in Fig. 1, showing the dispensing device in two positions;

Fig. 4 is another vertical cross-sectional view of the dispensing device taken along the line 4—4 in Fig. 1, showing a means for intermittently arresting the rotation of the spider-shaped member;

Fig. 5 is a diagram of the arrangement of interfolded towels adapted to be used in this invention; and

Figs. 6, 7, 8 and 9 are fragmentary side views showing the various positions of a following towel during the withdrawal of a leading towel with respect to another form of towel supporting means of this invention and also showing the upper portion of a vertically disposed blade of the spider-shaped member.

Referring to the drawings and particularly to Figs. 1, 2, 3 and 4, the dispensing device includes a cabinet 10, which may be formed of metal, wood or other suitable material, the cabinet providing a towel receiving supply magazine 11, adapted to contain a stack of multifolded towels 12. The arrangement of the towels and the manner of interfolding will be described in detail below.

The cabinet also includes a towel supporting means which may take the form of cylindrical shaped rod members 13, 14 and 15 which are substantially parallel to each other and to the rear wall 17 and front wall 18 of the cabinet. The rods extend the entire width of the cabinet and may be supported in any suitable manner as by being doweled into the sides 20 of the cabinet at locations 19 (Fig. 1) spaced from the bottom of the cabinet. The preferred arrangement of the rods is indicated in Figs. 2, 3 and 4 in which the rod 13 is of slightly larger diameter than rods 14 and 15 and is spaced above rod 14 but slightly below rod 15. The rods 13 and 14 are positioned adjacent each other toward the front of the cabinet, as indicated, in Figs. 2, 3 and 4, and the rod 15 is spaced from rods 13 and 14 toward the rear of the cabinet. The rods 14 and 15 define a centrally disposed outlet through which folded towels may be withdrawn.

A multi-bladed spider-shaped member 21 is rotatably supported between the sides 20 of the cabinet with its axis 26 thereof below the rods 13, 14 and 15.

The multi-bladed member 21 which, in transverse section, is generally spider-shaped, may be formed with a hub portion 22 and blade members 23 radially disposed around the axis 26 at 120° intervals. As shown, in Figs. 1 and 4, a mechanism may be provided to prevent free rotation of the spider-shaped member and to block any retrograde motion, i. e., clockwise as viewed in Figs. 2, 3 and 4, and to compel intermittent counterclockwise rotation only under a certain degree of resistance.

The mechanism includes a spider-shaped, heart-shaped cam member 25 secured to the shaft 26 which is the axis

3

on which the spider-shaped member 21 rotates. A pawl 27 may be pivoted on the side wall 29 of a housing for the mechanism at point 28. The free end 24 of the pawl is provided with a suitable cam engaging shape. A bracket 30, attached to the wall 29, guides the free end of the pawl. A compressor spring 31 is disposed between the upper side of the pawl 27 and the wall 32 which defines the top of the housing in which the pawl is disposed. Boss pins 33 are disposed on the upper side of the pawl 27 and the inside of the housing 32 to receive the compressor spring so that it may not be displaced.

The cam 25 is fixed on the axis 26 with respect to the blade members 23 so that one of the blade members 23 will be disposed in the vertical position shown in full line in Figs. 2 and 3, when the spider-shaped member is at rest.

Upon manual operation of the spider-shaped member 21 by rotation of the blade members 23 in the counter-clockwise direction as viewed in Fig. 4, the pawl 27 is cammed up against the pressure of spring 31. The pressure exerted by the spring causes the pawl to resist movement of the member 21 until the nose or end 24 passes point 34 of one lobe of the heart-shaped cam 25. After the end 24 of the pawl has passed the point 34, the spring pressed pawl pushes the spider-shaped member 21 counter-clockwise to the next position. In order to prevent clockwise motion, the end 24 of the pawl is disposed somewhat above a line through the axis 26 and the pivot point 28 of the pawl.

When the magazine 11 is charged with towels, the forward folded edge 35 of the lowermost towel is threaded through the outlet defined by the rods 14 and 15 and is positioned as shown in Fig. 2, behind the blade member 23, disposed in the vertical position which may be designated as the *a* position. When a towel is desired the operator presses downwardly in the direction indicated by the arrow in Fig. 2 on the blade member which is in the *b* position, i. e., disposed diagonally toward him. As the spider-shaped member 21 is rotated, the blade 23 in the *c* position, i. e. disposed diagonally away from the operator, is moved into the *a* position, and the blade member in the *a* position is rotated to the *b* position. By this movement the folded edge 35 of the lowermost towel 36 is positioned in front of the blade member which has been rotated into the *a* position so that said towel is visible and can be grasped and withdrawn. As the towel 36 is pulled in the direction indicated, the folded leading edge 35 of the following towel 37 is caused to double back upon the underside of itself so that in addition to the concave shape which was imparted to the leading edge 35 of the towel 37 by the manner in which the towels are supported in the magazine, the area of the following towel 37 near its edge 35 is bent so that it is directed away from the direction in which the towel 36 is drawn. By this bending the edge of the following towel 37 is caused to be directed into the dash line position shown in Fig. 3, in which it is disposed behind the blade 23 which is in the vertical position.

Supporting members 40 and 41 shown in Figs. 6 to 9 are alternative forms of towel supporting means and serve in the same manner as the supporting members 13, 14 and 15, shown in Figs. 1 to 4. The supporting member 40 corresponds to the supporting members 13 and 14. The supporting member 41, which corresponds to the member 15 of Figs. 1 to 4, is of sufficient lateral extent so that it may be connected to the rear wall 43 of the cabinet as shown in Fig. 6, and extends diagonally upward into towel engaging position.

For a more detailed description of the manner in which the towels are multifolded and in which the novel arrangement effects the desired results, reference is made to Figs. 5 to 9. In Fig. 5, the zig-zag shape of the multifolded towels and their interrelationship is diagrammatically shown. The reference numeral 35 indicates the leading edge of the several towels.

4

After the lowermost towel 36 has been moved into position in which it can be withdrawn by the user in the direction indicated in Figs. 6 to 9, the leading edge 35 of the following towel 37 is caused to loop backward under itself as the loop or second fold 38 in the leading towel 36, in which the leading edge of towel 37 is interfolded, is drawn over supporting member 40.

In Fig. 9, it will be seen that the leading towel 36 is substantially withdrawn and that the leading edge 35 of the following towel 37 has been directed behind blade member 42 which corresponds to the member 23 in Figs. 1 to 4.

Consideration is now given to the shape and functioning of the towel supporting members. The supporting members 40 and 41 in Figs. 6 to 9 are positioned and function in the same manner as members 13, 14 and 15 in Figs. 1 to 3, and the towel engaging surfaces of the respective members are generally similar although in the case of the supports shown in Figs. 6 to 9, member 40 is an integral piece whereas in Figs. 1 to 3, the front support is comprised of the members 13 and 14. Apart from this difference, the members 40 and 41 may be considered representative of the type of support means which is preferred in carrying out the improvement of this invention.

It will be noted that the towel contacting surface of the member 40 includes a high point 45, a relatively steeply sloped curved portion 46 and a relatively slightly sloped portion 47. The lower end 48 of the portion 47 is a curved arc of more than 90°, at least 45° on either side of horizontal. The towel contacting surface of the member 41 is an arc of at least 120°, 60° either side of vertical, high point 44.

It has been found that to obtain the most beneficial results, the towel contact surfaces must be of definite size, extend across the cabinet, and be located at clearly defined points both vertically and horizontally. The front one of these surfaces which is defined by the high point 45 of the member 40 and the adjacent sloping portions in Figs. 6 to 9, and by the member 13, in Figs. 1 to 4, is so placed that the leading edge 35 of each towel is formed as a curved section for a distance of about 1½" from the folded edge 35, it being assumed that the towels are approximately 3" in width from the leading fold edge 35 to the rear folded edges 39. As noted, the curve in the section of the towel adjacent the leading edge 35 is imparted partly by the manner in which the towels are supported on the front supporting member and also partly by the manner in which the leading edge 35 is folded under itself as the loop 38 of the leading towel is drawn up the curved surface 46 and over the high point 45.

The lower edge of the front surface which is defined by the arc 48 in Figs. 6 to 9 and by the member 14 in Figs. 1 to 4 is used only as a means of guiding the following towel to the point where it will fall behind the vertical blade of the spider-shaped member as it leaves the stack of towels. In this regard, it will be noted that the curved edge 48 is slightly to the rear of the center line of the vertical blade 42. The two cylindrical members 13 and 14 which constitute the front support and the guide may be made of curved sheet metal formed from one piece, as shown, whereby they have a cross-sectional configuration as shown in Figs. 6 to 9. The upper surface of the front support adjacent the high point 45 should be a curved, smooth surface of relatively large radius, e. g. ¼". The rear or lower guiding edge of the front supporting member should also be a curved smooth surface of relatively smaller radius, e. g. ⅜". The rear supporting surface is in the best practice located behind and slightly above the front support so that high point 44 of the member 41 is slightly above the high point 45 of the member 40. The radius of the rear supporting member 41 may be the same or of slightly smaller radius than that of the front supporting member in the area of the high point 45.

The function of the rear support member 41 is to break down adhesion between the interfolded towels and thus permit the front support to form the above mentioned reversely curved surface in the leading edge 35 of the towel following the one in the process of extraction.

Prior to this invention, it has been customary to support towels adjacent the folds so that the towels are formed convexly downward. It will be understood that when towels are supported in that manner rather than in the manner of this invention, the leading edges of the following towels would be curved toward the front of the cabinet and, therefore, would follow the towel being extracted between the upper end of the blade member and the lower end of the front supporting means.

It will, therefore, be appreciated that the improvement of this invention achieves the desired objects of supporting the towels in a manner so that they are concavely formed downwardly and so that the leading edge of a following towel is curved concavely toward the rear of said cabinet in such manner that it will not follow a towel being extracted between the lower end of the towel magazine outlet and the upper edge of a removable barrier, i. e., the vertically disposed blade member.

In accordance with the provisions of the patent statutes, I have herein described the principle of operation of the invention, together with the elements which I now consider the best embodiments thereof, but I desire to have it understood that the structure disclosed is only illustrative and the invention can be carried out by other means. Also, while it is designed to use the various features and elements in the combinations and relations described, some of these may be altered and modified without interfering with the more general results outlined.

Having thus described my invention, I claim:

1. In an apparatus for singly dispensing multifolded paper towels having a towel supply magazine, a multi-bladed, spider-shaped member having a plurality of radially disposed blades mounted below the magazine and mounted for intermittent rotary motion, one of the blades of said member being disposed in a vertical position to normally block access to a towel depending from the magazine, said blade, upon intermittent rotary motion of said spider member, produced by manual action upon another blade, being displaceable to a position rendering said towel accessible for manual withdrawal and a further blade upon intermittent rotary motion with the spider-shaped member adapted for deflecting said towel edge forwardly and thereupon serving as a barrier preventing access to the leading edge of a following towel; a novel towel supporting means, comprising members having curved upper surfaces for engaging and supporting the lowermost towel in the magazine only along two lines parallel to the folds of the towel and spaced inwardly

therefrom, whereby the undersides of the towels are given a concave configuration, the parallel supporting means being spaced apart and defining an outlet through which the towels are withdrawn from the magazine and towel guiding means positioned below the supporting means and said guiding means having a curved guiding surface which is slightly to the rear of the center line of the vertically disposed blade for guiding the towels to the inaccessible side of the blocking blade of said member.

2. In an apparatus for singly dispensing multifolded paper towels and having a towel supply magazine for containing a plurality of multifolded towels, means at the bottom of the magazine for discouraging towel wastage, including in combination novel means for supporting the towels in the magazine which means define a towel outlet through which towels are to be withdrawn, at least one displaceable member normally disposed in a vertical position below and in front of the towel outlet but displaceable to permit access to a towel depending from the outlet, and guide means below the supporting means and above and slightly to the rear of the center line of the normal vertical position of the displaceable member for guiding towels from the outlet to a position behind the displaceable member, in its normal position, the supporting means includes stationary parallel supporting members having curved upper surfaces for supporting the lowermost towel only along two lines spaced inwardly from and parallel to the folded outer edges of the said towel, said supporting members being spaced apart to define the outlet through which towels are adapted to be withdrawn; the towel guiding means having a curved surface positioned at a point below the front supporting member and slightly to the rear of the center line of the displaceable member, when the latter is in its normal vertical position, for guiding towels to a position to the rear of the displaceable member.

3. The apparatus of claim 2 wherein the curved upper surface of the front supporting member is on a lower level than the curved upper surface of the other supporting member.

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