

Oct. 20, 1959

R. E. THIERS ET AL
DENTAL FLOSS AND DISPENSER

2,909,277

Filed Aug. 13, 1956

2 Sheets-Sheet 1

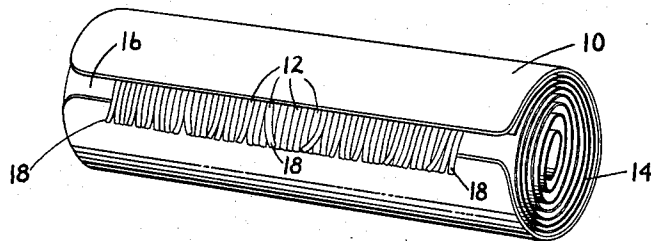


FIG. 1

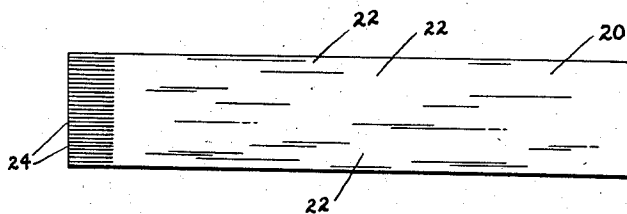


FIG. 2

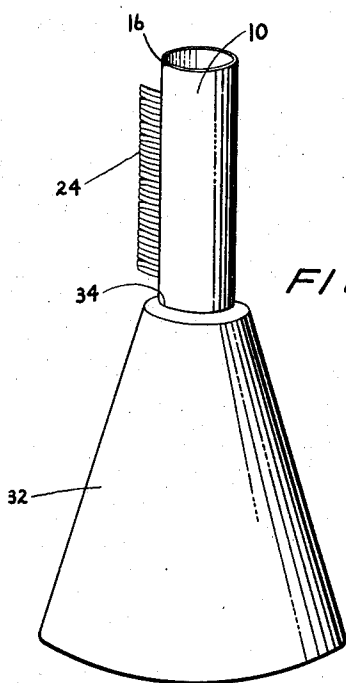


FIG. 5

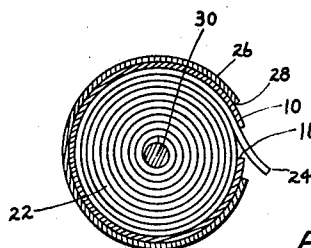


FIG. 3

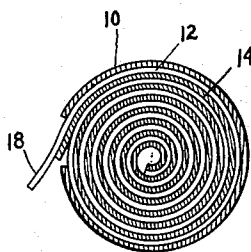


FIG. 4

INVENTOR
Ralph E. Thiers
Judith G. Thiers
BY
Ralph L. Greenfield
att'y

Oct. 20, 1959

R. E. THIERS ET AL
DENTAL FLOSS AND DISPENSER

2,909,277

Filed Aug. 13, 1956

2 Sheets-Sheet 2

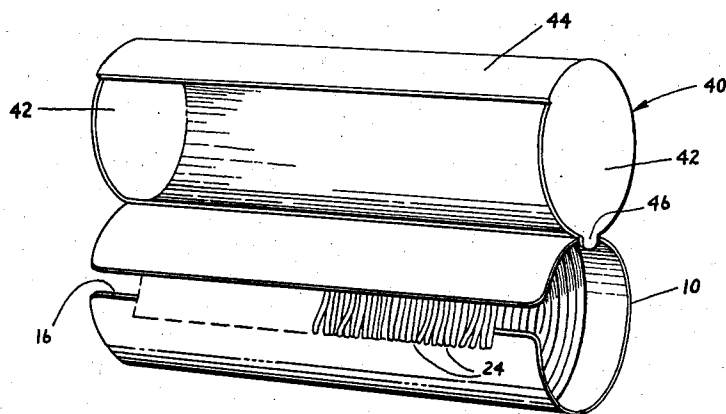


FIG. 6

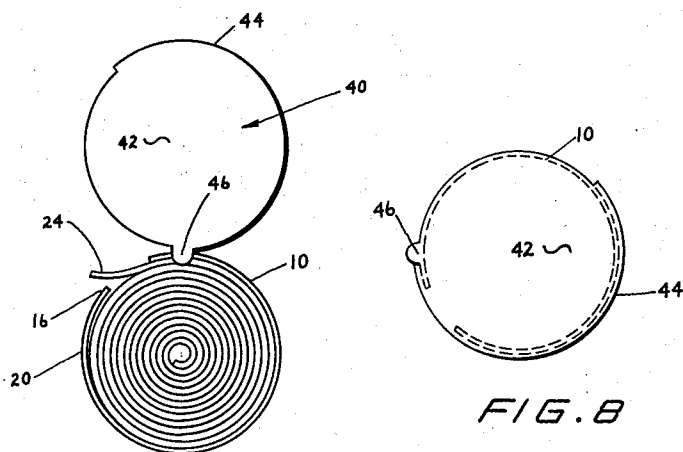


FIG. 7

FIG. 8

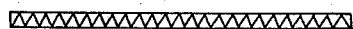


FIG. 9

INVENTOR.
Ralph E. Thiers
BY Judith G. Thiers
Atty.

1

2,909,277

DENTAL FLOSS AND DISPENSER

Ralph E. Thiers and Judith G. Thiers, Revère, Mass.

Application August 13, 1956, Serial No. 603,480

7 Claims. (Cl. 206—56)

This invention relates to dental floss and more particularly comprises a new and improved dental floss material and a new and improved means for packaging it.

Dental floss now on the market is made of a wax-coated nonstretchable thread and is packaged as a single long strand in a cylinder. The cylinder normally carries a cap having an opening through which one end of the thread extends. Ordinarily, a cutting tooth is formed in the cap to facilitate breaking of the thread into usable lengths.

Both the dental floss itself and the manner in which it is packaged have a number of disadvantages. For example, the thread, which is extremely fine, very often cuts the gums adjacent to the base of the teeth when the slightest excess downward pull is applied to the thread. This occurs frequently when the thread must be pulled between tight tooth contacts. The thread, although wax coated, often becomes frayed and the frayed filaments of the thread get caught between the teeth. Furthermore, the manner in which the thread is packaged requires the user to employ both hands in order to cut a usable length of the dental floss from the single long strand within the cylinder. Moreover, the end of the single strand which is supposed to extend through the opening in the cap occasionally slides back into the cylinder and necessitates the removal of the cap in order to recover the end of the strand.

All of these disadvantages are overcome in the preferred embodiment of our invention. In addition, many new features are incorporated into both the floss and its package, which offer new conveniences to the user.

One important object of our invention is to provide a dental floss which slides easily between adjacent teeth even though they are very close together.

Another important object of our invention is to provide a dental floss which after being inserted between adjacent teeth, assumes a shape which is effective in removing trapped food particles.

Another important object of our invention is to provide a dental floss which cannot fray and does not readily break.

Another important object of our invention is to provide a package for dental floss which allows usable lengths of the floss to be withdrawn from the package without the necessity of cutting or tearing.

To accomplish these and other objects, the preferred embodiment of our invention includes among its important features a number of strands of dental floss made of a blend of synthetic and natural rubber. These strands may be cut in six-inch lengths and may have a cross-section .025 inch square. It may be desirable to provide the strands with a triangular cross section so that the floss naturally conforms to the shape of the opening between the gums and adjacent teeth. The individual strands are disposed side by side and are yieldably held together by a rubberized cement or some other equivalent adhesive. This adhesive holds the

2

strands together as a single wide sheet of rubber, but allows the strands to be easily separated from the sheet with a minimum of pull. The strands in sheet form are rolled so that the axis of the roll lies perpendicular to the individual strands of floss.

We provide an open-ended cassette cylindrical in shape and having an elongated slot formed through its wall parallel with the cassette axis as a package or holder for the roll of strands of dental floss. The outer end of each of the individual strands forming the sheet extends out through the slot of the cassette so that a user may easily strip the end strands from the sheet.

Of course, conventional dental floss may be packaged in the same cassette as described above. It may be desirable to substitute for the adhesive some form of paper backing to hold the floss in rolled and sheet form. Such a combination comprises a second embodiment of my invention.

Preferably a cover member is secured to the cassette to close the slot and the open ends. This cover member may include a pair of parallel discs interconnected by a curved wall which extends about the periphery of the discs somewhat more than 180 degrees. The curved wall made of resilient material conforms to the circular contour of the cassette and is hinged to the cassette wall above the slot. The cover may be opened and closed by pivotally moving it on the hinges. Because the curved cover wall extends a bit more than 180 degrees about the cassette wall, a clasp or other locking device is unnecessary to maintain the cover in its closed position.

These and other objects and features of our invention, along with incident advantages will be better understood and appreciated from the following detailed description of a number of embodiments thereof, selected for purposes of illustration and shown in the accompanying drawing in which:

Figure 1 is a view in perspective of one embodiment of our invention,

Figure 2 is a plan view of a number of strands of rubber dental floss secured together in accordance with our invention,

Figure 3 is a cross-sectional view of another embodiment of our invention,

Figure 4 is a cross-sectional view of the embodiment of our invention illustrated in Figure 1,

Figure 5 is a view in perspective of a package of dental floss mounted on a stand in accordance with our invention,

Figure 6 is a view in perspective of the preferred embodiment of our invention,

Figures 7 and 8 are end views of the preferred embodiment illustrating the cover member in its opened and closed positions, respectively, and

Figure 9 is an end view of a number of strands of rubber floss triangular in cross section and assembled in sheet form in accordance with our invention.

The embodiment of our invention illustrated in Figure 1 includes a cassette or casing 10 which contains a number of individual strands of dental floss 12. The strands of dental floss 12 are of the conventional variety, being made of wax-coated thread. The individual strands 12 are disposed side by side and are wound with a paper backing 14 (see Figure 4). The paper backing 14 performs no important function when the roll is inserted in the cassette 10 but is used only to facilitate the winding of the dental floss in the first instance. Thus, other methods of winding the floss to fit the cassette may be used without departing from our invention.

The cassette 10 may be made of metal, plastic, or any other rigid material and includes a slot or opening 16 parallel with the axis of the cassette. The ends 18 of the

individual strands 12 of the floss extend through the slot 16 in the manner illustrated in the drawing. From an inspection of Figure 1 it is clear that the strands 12 may easily be stripped from the package one by one, merely by grasping the end 18 of the outermost strand and pulling it away from the cassette in a direction parallel with the cassette axis. With regular cotton or nylon floss, the individual strands should be 10 to 14 inches long for maximum convenience. The cassette itself may be approximately one and one half inches long or any size which may be carried conveniently in the pocket or purse.

In Figure 2 we have illustrated the preferred form of dental floss. The sheet material 20 illustrated in that figure is composed of a number of individual strands 22 of rubber, preferably a blend of synthetic and plantation rubber. Each of these strands may be approximately 6 inches in length and .025 inch square in cross section. Of course, they may be made in different cross-sectional shapes and sizes to suit different tooth spacings. A sheet of strands triangular in cross section is shown in Figure 9. The individual strands 22 are held together in sheet form, as shown in the drawing, by a rubberized cement. This adhesive material allows the user to grasp one end of either of the outer strands and strip it from the sheet.

The blend of natural and synthetic rubber has many advantages. First of all it is highly stretchable. In addition, it has a very high tensile strength per unit area when fully extended. Of equal importance is the fact that it is abrasive resistant to a degree considerably greater than natural rubber alone. This blend of natural rubber and synthetic rubber may be composed of equal parts by weight of each.

Rubber dental floss itself has many advantages, not the least important of which is that its cross sectional area may be reduced by stretching the strand. This permits it to be slipped easily between adjacent teeth which are very close together. After the floss has been properly inserted between the teeth, the tension may be relaxed to increase its cross section so that the strand bears against the gums and the bases of adjacent teeth at the same time. That is, it may expand to completely fill the space between the teeth. It does not break in use as readily as does the conventional type of dental floss shown in Figure 1, particularly when it is coated with a substance which makes it extremely slippery when wet and nontacky when dry. This coating to which we refer may have a talc base and in addition may be slightly flavored to make the floss more pleasing to the user. Of course, the rubber dental floss cannot fray or ravel and, therefore, small filaments cannot get caught between the teeth. When it breaks, it breaks cleanly so that unravelled edges are not present. The rubber itself exerts a traction on food particles and draws them out in a manner unparalleled by either the conventional type of dental floss or toothpicks. Moreover, the particular blend of synthetic and plantation rubber which we contemplate using may be especially treated to have a high degree of whiteness and at the same time be resistant to ageing and to the action of heat, water and mild chemical reagents.

It should also be appreciated that this particular floss may be made with abrasive inclusions and/or may be corrugated to improve its cleaning properties. In addition, an antiseptic may be included in the rubber as an additional feature.

The sheet 20 of strands of dental floss 22 may be packaged in the cassette without the aid of a backing. The sheet 20 may be rolled from the right as shown in Figure 2 and easily slipped into the cassette 10 with the ends 24 of the strands 22 extending out of the cassette through the opening or slot 16.

The embodiment of our invention illustrated in cross-section in Figure 3 includes a cover member comprising a second cassette 26. The outer or second cassette 26 which has an opening 28 is slidably mounted on the cassette 10 so that the opening 28 may be moved to a posi-

tion wherein it exposes the opening 16 of the inner cassette. By viewing Figure 3, the reader will appreciate that the outer cassette 26 made of a resilient material may be rotated clockwise so that its wall overlies the opening 16 and the ends 24 of the strands 22. Such an arrangement is particularly desirable when the floss is to be carried in the pocket or purse of the user, for the ends 24 will not become soiled when the outer cassette 26 is rotated clockwise to what may be called a closed position. This arrangement, of course, permits the user to rotate the cassette clockwise to expose the ends 24 whenever he desires to remove one strand of the floss.

In Figure 3, we have also illustrated a shaft 30 which extends axially through the center of the cassette. The shaft 30 may be used to facilitate the rolling of the sheet but is not necessary.

In Figure 5 we have illustrated the manner in which a cassette may be mounted for use in the home or in a dentist's office so that the strands may easily be removed with one hand. A base 32 (of any particular design) has a recess 34 formed in its upper surface which receives one end of the cassette 10. The base 32 firmly holds the cassette when one of the strands of floss is stripped from it. This is particularly desirable for a dentist or technician for his complete attention will not be required to strip a thread of dental floss from the package. Because neither a paper backing nor a shaft is employed in the combination, the uppermost strand 22 may be stripped from the cassette by pulling either radially or axially on the end of the strand relative to the cassette axis.

In Figures 6 to 8 we have illustrated the preferred embodiment of our invention. This embodiment includes the cassette 10 having a slot or opening 16 in its side wall and through which extend the ends 24 of the rubber floss 22 contained within it. Neither a paper backing nor shaft is used, but rather the sheet 20, made up of the strands 22, is rolled upon itself and held together by the rubberized cement.

The cassette 10 carries a cover member 40 made of two parallel circular discs 42 interconnected by a curved wall 44 made of resilient material. The wall 44 is secured to the periphery of the discs 42 and defines an arc somewhat more than 180 degrees. A pair of hinges 46, the details of which form no part of this invention, pivotally support the cover member 40 on the cassette 10 so that it may be opened and closed as shown in Figures 7 and 8 respectively. The cover member 40 pivots on the wall of the cassette 10 adjacent the opening 16 and covers that opening when moved to the closed position. When the curved wall 44 overlies the opening 16 and the ends 24 of the floss, the discs 42 close the open ends of the cassette and completely protect the floss. This cover member 40 is held in the closed position by the spring action of wall 44 for it extends more than 180 degrees about the wall of the cassette. However, slight thumb pressure causes the wall 44 to release the wall of the cassette and the cover may swing on the hinge to the open position shown in Figure 7, exposing the ends of the floss so that strands may be stripped from the cassette for use. It will be appreciated that this same cover member may be used with any of the other embodiments of our invention illustrated. From the foregoing description, those skilled in the art will appreciate that numerous modifications may be made of our invention without departing from the spirit thereof. Therefore, we do not intend to limit the breadth of our invention to the specific embodiments illustrated and described, but rather it is our intention that the scope of this invention be determined by the appended claims and their equivalents.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A device of the character described comprising a wall defining a cylindrical casing, an opening in the wall of the casing and parallel to the axis of said casing, a

5

number of individual strands of dental floss rolled side by side and disposed within said casing, one end of each of said strands extending through the opening in the wall of the casing, means for retaining the strands side by side in the casing, a second casing surrounding and rotatably supported on the first-named casing, and a slot cut through the second casing and parallel to the axis of the second casing whereby when the second casing is rotated on the first-named casing so that the slot overlies the opening, the ends of the strands extend out of both of the casings, and when the second casing is rotated so that its slot is displaced from the opening, the ends of the strands are confined within the second casing.

2. A device of the character described in claim 1 further characterized by a shaft extending along the axis of the first casing and supporting the individual rolled strands of dental floss.

3. A device of the character described comprising a wall defining an open ended cylindrical casing, an opening formed in the wall of the casing, a number of wound strands of dental floss assembled in the casing with one of the ends of each strand extending through the opening, means for holding the strands in their assembled position in the casing, a curved plate hinged to the casing and adapted to cover and expose the opening, and discs secured to the curved plate and overlying the open ends of the casing when the plate covers the opening.

4. A device of the character described comprising a wall defining a cassette, a slot formed in the wall of the cassette, a number of individual strands of dental floss rolled side by side in the cassette with the axis of each rolled strand being coincident with the center of the cassette and having their outer ends extending through the

6

slot, means for retaining the rolled strands side by side in the cassette, a plate hinged to the cassette and adapted to extend across the slot, and means for releasably holding the plate over the slot.

5. A device of the character described comprising a wall defining a cassette, a slot formed in the wall of the cassette, a number of individual strands of dental floss rolled side by side in the cassette with the axis of each rolled strand being transverse to the plane of the strands and having their outer ends extending through the slot in the wall of the cassette, means for retaining the rolled strand side by side in the cassette, and means secured to the cassette and movable between positions wherein it overlies the slot and uncovers the slot.

6. A device as defined in claim 5 further characterized by the individual strands of dental floss being made of rubber.

7. A device as defined in claim 5 further characterized by the means for holding the rolled strands side by side being an adhesive material.

References Cited in the file of this patent

UNITED STATES PATENTS

25	405,443	Stamm	June 18, 1889
	706,998	Parmenter	Aug. 12, 1902
	735,757	Grubbs	Aug. 11, 1903
	1,886,842	Shaw	Nov. 8, 1932
	1,999,879	Lee	Apr. 30, 1935
30	2,008,206	Grant	July 16, 1935
	2,083,398	Rohland	June 8, 1937
	2,419,809	Avery	Apr. 29, 1947
	2,739,702	Eriksen	Mar. 27, 1956