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DENTAL FLOSS HOLDER

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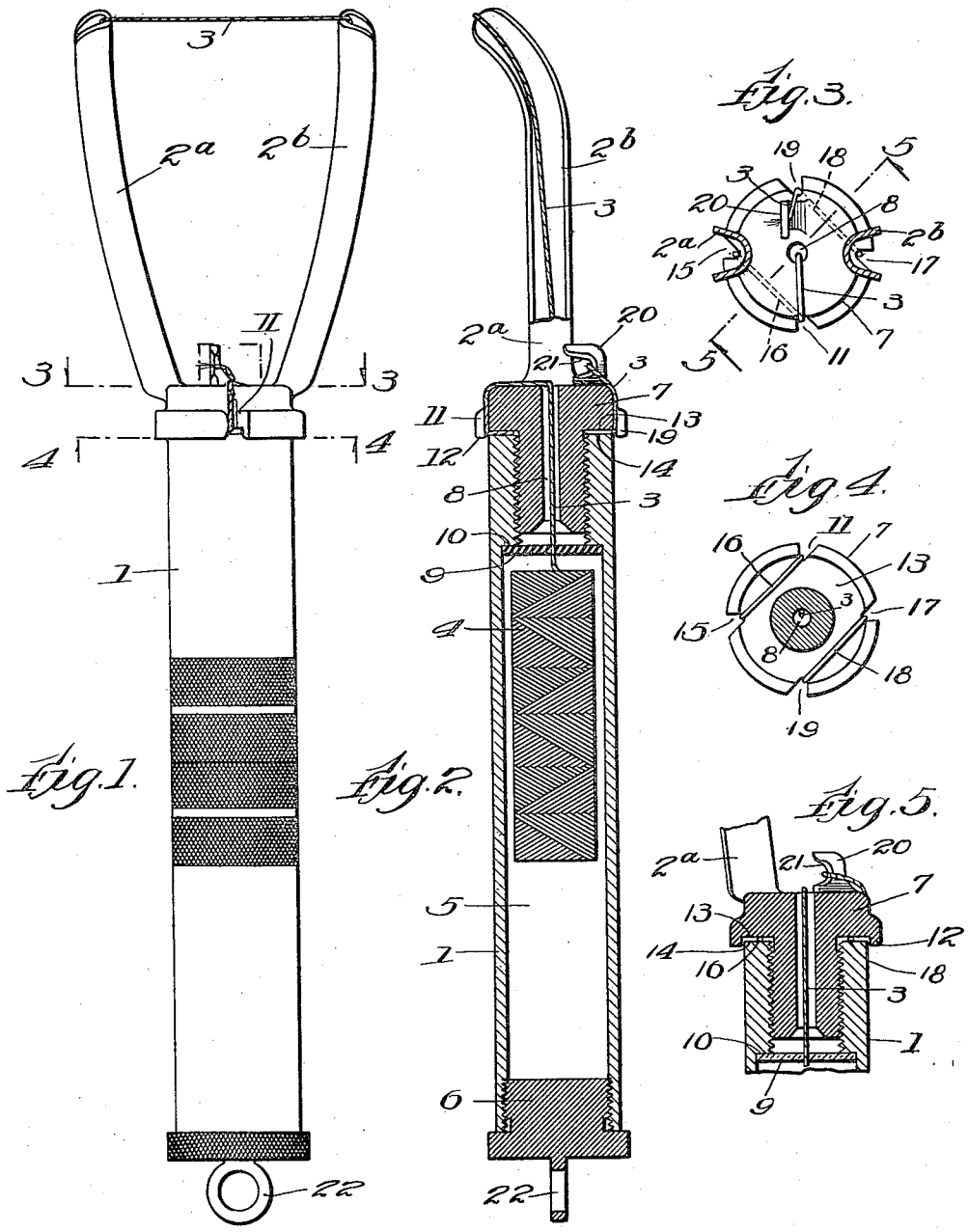


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Inventor:  
Frederick O. Gamble

Witness:  
*[Signature]*

by *[Signature]*  
his Atty.

# UNITED STATES PATENT OFFICE.

FREDERICK O. GAMBLE, OF MEMPHIS, TENNESSEE.

DENTAL FLOSS HOLDER.

Application filed March 17, 1921. Serial No. 452,990.

*To all whom it may concern:*

Be it known that I, FREDERICK O. GAMBLE, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Dental Floss Holders, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide a convenient and sanitary tool for holding and manipulating dental floss or any other thread used for the same purpose, namely, for cleaning out and removing obstructions from between the teeth. It consists in the elements and features of construction hereinafter described and shown in the drawings as indicated by the claims.

In the drawings:—

Figure 1 is a front elevation of a tool embodying this invention showing the thread or dental floss mounted in operative position thereon.

Figure 2 shows the handle portion of said tool in axial section while illustrating the thread-supporting prongs in side elevation, the near prong being broken out just above the handle portion.

Figure 3 is a detail section taken as indicated at line 3—3 on Figure 1.

Figure 4 is a transverse section taken as indicated at line 4—4 on Figure 1.

Figure 5 is a detail section taken as indicated at line 5—5 on Figure 3.

As illustrated in the drawings the tool comprises a handle portion, 1, surmounted by a fork of two prongs, 2<sup>a</sup> and 2<sup>b</sup>, between which the thread or "floss," 3, is exposed for use and held taut. This floss is obtainable in the market in the form indicated at 4 in Figure 2 which represents a quantity of the thread wound in cylindrical form (upon a mandrel which has been removed) and covered or saturated with paraffin which serves to hold the coil in shape but permits the loose end to be gradually unwound under a slight tension. To receive this coil or cartridge of the floss the handle, 1, is therefore made hollow to provide a cylindrical chamber, 5, into which the cartridge may be introduced by removing the threaded terminal plug, 6. At the opposite end the cylinder, 1, is closed by a threaded head member, 7, having an axial bore, 8,

through which the floss, 3, emerges. To add further resistance to unwinding of the floss from the coil or cartridge, 4, a washer, 9, of some yielding material such as rubber may be inserted against the shoulder, 10, formed in the hollow handle, 1, and the floss may be led through a small central aperture in the washer and thence into the bore, 8, of the head, 7.

The cartridge, 4, having been thus inserted and a short length of the floss threaded through the bore, 8, the handle, 1, may be grasped in one hand and the extreme end of the floss may be gripped between the thumb and forefinger of the other hand for threading the tool. Drawing out five or six inches of the floss from the apertured head, 7, it is first laid across the top of the head radially and downwardly into a notch, 11, formed in a flange, 12, of the head which slightly overhangs the end of the cylindrical handle, 1. During the threading operation the said handle is unscrewed by one or two turns from the overhanging shoulder, 13, of the head so as to leave ample space between the said shoulder and the end, 14, of the handle. This permits threading the floss from the notch, 11, through said space in a straight line to the notch, 15, as seen at 16 in Figures 3 and 4. Emerging upwardly through the notch, 15, the floss is carried up through the outwardly facing channel of the prong, 2<sup>a</sup>, and from the open upper end of said channel the floss is then stretched across to the prong, 2<sup>b</sup>, and downwardly through its channel to the notch, 17, in the head, 7. From the notch, 17, the thread again passes under the head in a straight line at 18 and substantially parallel to the portion, 16, emerging finally at the notch, 19, through which it is drawn upwardly adjacent the cutting hook, 20, which extends rigidly from the upper face of the head, 7. During this entire threading process it is not necessary to release the original grip of the thumb and finger upon the extreme end of the thread or floss and as the intervening portion between this extreme end and the cartridge coil, 4, is fresh and clean there is really no opportunity for contaminating it in the threading process. As the end of the floss is drawn up through the notch, 19, the head, 7, may be gripped between the thumb and third or fourth finger of the hand holding the end of the thread and without re-

leasing the grip on the thread; then the handle, 1, may be screwed up so as to clamp the portions, 16 and 18, of the floss between the shoulder, 13 of the head and the squared end, 14, of the handle. It may be noted that the final twist of the handle in this clamping movement will tend to draw the part, 16, of the thread away from the notch, 15, and to draw the part, 18, away from the notch, 17, and that since these notches lead respectively to the channeled prongs, 2<sup>a</sup> and 2<sup>b</sup>, the result is to draw downwardly with like tension upon the thread in both channels and thus tension the exposed portion extending between the upper ends of the prongs. This clamping movement therefore not only secures the floss but tensions it in position for use. After it is thus clamped any excess length may be readily cut off by simply pulling it around the sharpened edge, 21, of the hook, 20, leaving only a short terminal portion of the floss extending from the notch, 19.

The rotary clamping action of the end, 14, of the handle, 1, against the portions, 16 and 18, of the floss is observed to have a tendency to force these portions outwardly toward the periphery of the circular head; and to prevent the floss from being thus forced out from between the clamping face, 13, of the head, 7, and the end, 14, of the handle, the flange, 12, is formed to closely overhang the extreme end portion of the handle adjacent its clamping surface, 14, so that the overhanging flange, 12, thus confines the floss between the clamping surfaces as clearly indicated in Figure 5.

It may be noted that the design of the tool is extremely simple rendering it possible to readily cleanse all the exposed surface and thus render the device absolutely sanitary at all times. As above pointed out it is never necessary to touch with the fingers the portion of the floss which is stretched between the prongs, 2<sup>a</sup> and 2<sup>b</sup>, and which is to come into contact with the teeth. When the device has been used the length of floss exposed on the prongs and on the head, 7, may be released from the clamping action of the handle by unscrewing the latter slightly and this entire length of the floss may be broken off around the cutting hook, 20, and discarded leaving only a short end projecting from the bore, 8, of the head, 7. In the unthreading operation as in the threading of the prongs, it is not necessary to touch any part of the floss except the extreme end. Preferably after the used length of floss has been discarded the head, 7, should be completely unscrewed from the handle and thoroughly rinsed in water or it may be sterilized in boiling water if desired. After replacing the head, 7, with a short length of floss threaded through its bore, 8, the device may be hung up in inverted position by

means of the eye, 22, conveniently provided on the plug, 6, and in this position there will be the least opportunity for contamination of the floss in the bore, 8, from dust or germs in the air.

It may be noted that the threading and unthreading of the prongs without releasing the original grip of the floss is greatly facilitated by the fact that one side of each of the notches, 11 and 15, extends parallel to the direction of the part, 16, of the floss which is stretched between these notches and similarly one also of each of the notches, 17 and 19, is parallel to the portion, 18, of the floss. This allows the floss to be extended in a straight line from the notch, 11, and then swung up into the notch, 15, bearing against the deepest portion of said notch and without any particular steering to avoid conflict with the side walls of the notch, 15. The other side of the notch, 15, forms an acute angle with the wall which is parallel to the thread, 16, and thus insures that the thread when tensioned will be drawn deeper into the notch rather than escaping therefrom. In the notch, 11, the wall which extends acutely from the wall which is parallel to the thread, 16, is itself substantially radial with respect to the vertical axis of the head, 7; so that the portion of the floss, 3, emerging from the axial bore, 8, of the head and extending radial to the notch, 11, is easily and naturally folded down into the notch past its radial face and then across the under side of the head toward the notch, 15.

In previous devices of this kind it has been proposed to provide eyes or other complicated guidance for the floss at the ends of the prongs but I have found that the depth of the channels in the prongs, 2<sup>a</sup> and 2<sup>b</sup>, and the tension on the floss itself is entirely adequate to retain it in position so that I have made the prongs simply with end opening channels whose edges are merely rounded or blunted to avoid cutting the floss as it is stretched between the prongs.

I claim:—

1. In a dental floss holder the combination of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other and with peripheral notches in the head between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, and a peripheral flange on one of said parts extending past the planes

of said opposed surfaces in their clamping position for retaining the floss between them.

2. In a dental floss holder the combination of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other and with peripheral notches in the head between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, and a hook-shaped cutter projecting from the outer surface of the head between the prongs adjacent one of the notches.

3. In a dental floss holder the combination of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other and with peripheral notches in the head between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, the head having four such peripheral notches and the floss extending between adjacent pairs in substantially parallel lengths at opposite sides of the axis of said head, each notch having two walls diverging outwardly and one wall of each notch being substantially parallel to the length of floss which extends thereto from the adjacent notch to facilitate threading the floss in the notches.

4. In a dental floss holder the combination of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other and with peripheral notches in the head between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, the head having four such peripheral notches and the floss extending be-

tween adjacent pairs in substantially parallel lengths at opposite sides of the axis of said head, each notch having two walls diverging outwardly and one wall of each notch being substantially parallel to the length of floss which extends thereto from the adjacent notch to facilitate threading the floss in the notches, the bore in the head through which the floss emerges being centrally disposed therein, and the other wall of each notch being substantially radial with respect to said bore.

5. In a dental floss holder the combination of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other and with peripheral notches in the head between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, the head having four such peripheral notches and the floss extending between adjacent pairs in substantially parallel lengths at opposite sides of the axis of said head, each notch having two walls diverging outwardly and one wall of each notch being substantially parallel to the length of floss which extends therefrom to the adjacent notch to facilitate threading the floss in the notches, and a peripheral flange on the head extending in sections between the notches and interrupted thereby overhanging the handle to retain the floss between the opposed clamping surfaces.

6. In a dental floss holder the combination of a handle and a separable head for the handle carrying a pair of divergent prongs adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the handle, the head and handle having threaded engagement with each other with a stop shoulder on one of said parts opposing a transverse surface of the other for clamping portions of the floss between them when the parts are screwed together, the peripheral portion of the head having four approximately radial abutment surfaces between adjacent pairs of which the floss extends in two substantially parallel lengths to be clamped between said opposing surfaces of the head and handle, the floss at the ends of said parallel lengths being bent abruptly toward the outer end of the head and along the abutment surfaces, and the peripheral portion of the head adjacent said abutments being cut away clear of the

extended lines of said parallel lengths of the floss to facilitate threading the floss around said abutments.

7. In a dental floss holder the combination  
5 of a hollow handle adapted to contain a quantity of floss wound in cylindrical form, and a separable head for the handle carrying a pair of divergent channelled prongs  
10 adapted to support the floss in tension between their outer ends, said head having a bore through which the floss is led out from the hollow handle, the head and handle having threaded engagement with each other  
15 with a stop shoulder on one of said parts opposing a transverse surface of the other end and with peripheral notches in the head

between which the floss is threaded to extend across said opposing surfaces to be clamped between them when the parts are to be screwed together, and a stop shoulder 20 formed in the hollow handle between the cylindrical charge of floss and the bore in the head, together with a disk of elastic material interposed against said shoulder and having an aperture tightly fitting the floss 25 for frictionally resisting its feed through said bore in the head.

In testimony whereof, I have hereunto set my hand at Memphis, this 11th day of March, 1921.

FREDERICK O. GAMBLE.