United States Patent [19]

Schlegel

[11] **3,847,168**

[45] **Nov. 12, 1974**

[54] **TOOTH CLEANING APPLIANCE**

[76] Inventor: **Ulrich R. Schlegel,** Bellevue Farms, Rte. 1, Towson, Md. 22186

[22] Filed: **Aug. 8, 1973**

[21] Appl. No.: **386,529**

[52] **U.S. Cl.** ..... **132/92 R**

[51] **Int. Cl.** **A61c 15/00**

[58] **Field of Search** ..... 132/92 R, 91, 84, 93; 15/167

[56] **References Cited**

UNITED STATES PATENTS

1,220,409	3/1917	Freschl	132/92 R
1,966,463	7/1934	Rose	132/92 R
2,577,597	12/1951	Wright et al.	132/92 R
2,784,722	3/1957	Chamberlin et al.	132/92 R
3,672,377	6/1972	Greenacre	132/92 R

Primary Examiner—G. E. McNeill

Attorney, Agent, or Firm—Mason, Fenwick & Lawrence

[57] **ABSTRACT**

A manually held dental floss/toothbrush is disclosed including an elongated handle member having a dental floss storage compartment with a Y-shaped dental floss supporting and tensioning means mounted on one end of the handle; a floss tensioning pin is mounted in the handle member for tensioning dental floss on the Y-shaped means. Another aspect of the invention resides in an implement storage chamber in the handle in which a toothbrush head or the Y-shaped member are stored during use of the other member.

10 Claims, 8 Drawing Figures

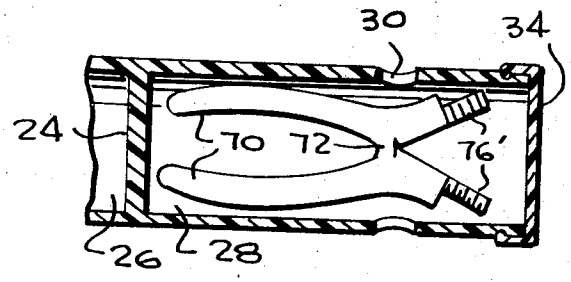


Fig-1

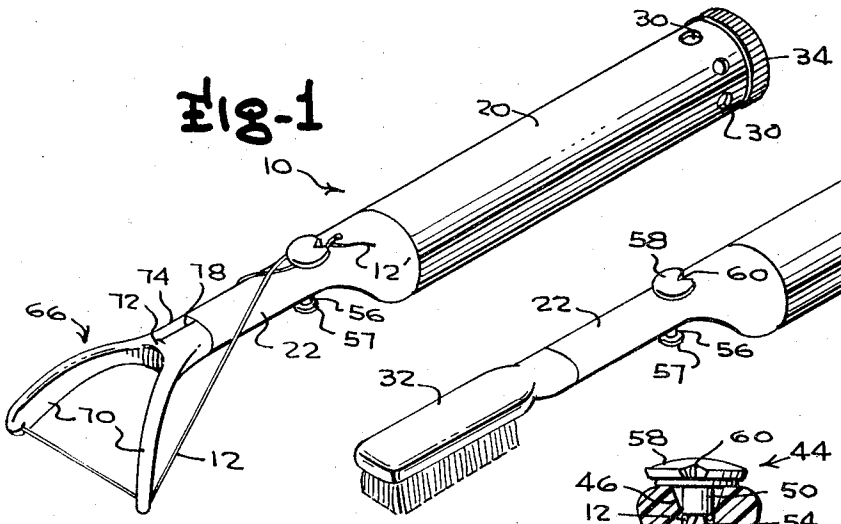


Fig-2

Fig-6

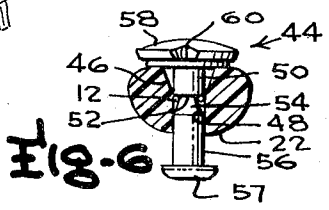


Fig-7

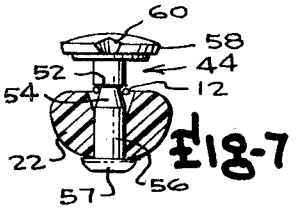


Fig-3

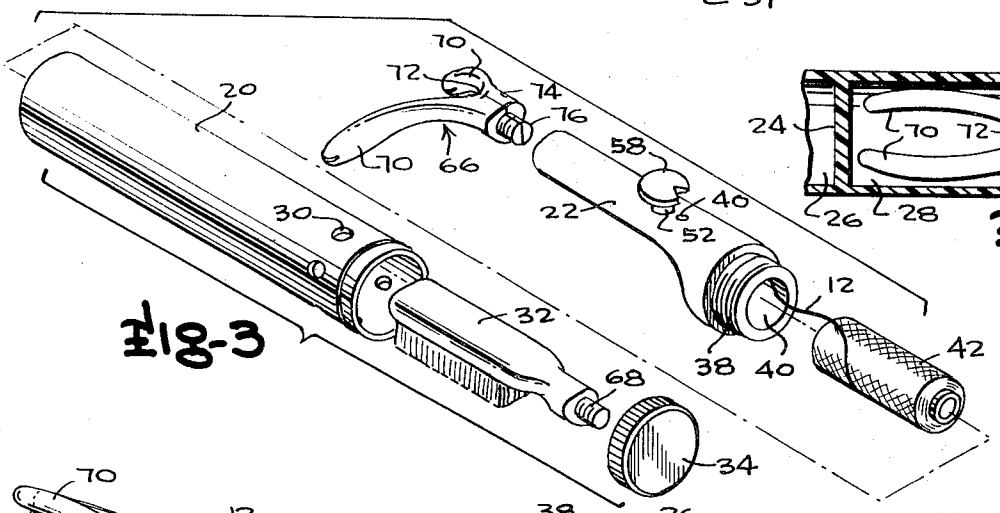


Fig-8

Fig-4

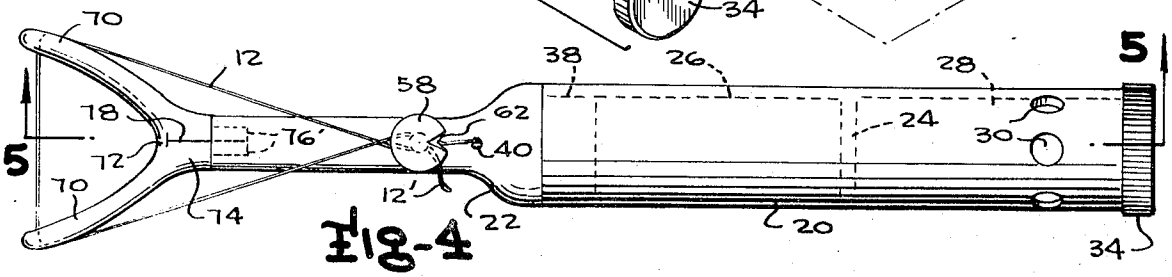
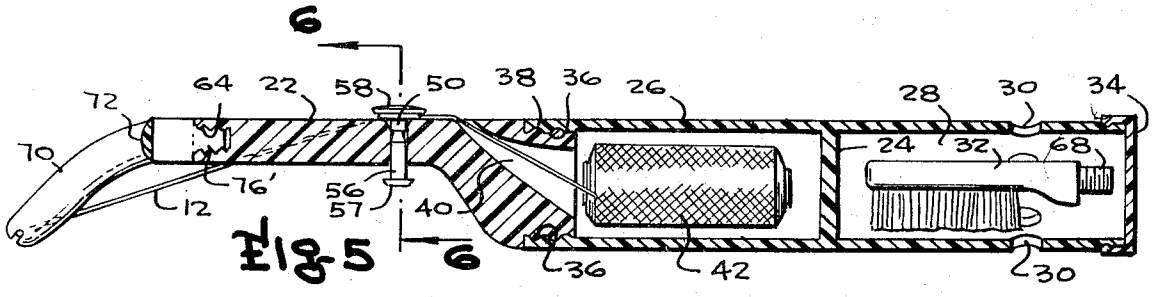


Fig-5



TOOTH CLEANING APPLIANCE

This invention is in the field of dental appliances and is specifically directed to a tooth cleaning device having the capacity for both brushing teeth and cleaning teeth by the use of dental floss.

A wide variety of dental floss supporting and dispensing appliances have evolved over the years with many of such devices incorporating fork-like means for holding a strand of dental floss to be employed between the user's teeth. Unfortunately, the prior known devices have frequently failed to maintain the floss in a taut condition necessary for successful use and have also been difficult to manipulate and properly use due to their geometric configuration.

Additionally, the prior known devices have frequently been unsanitary due to lack of provision for protecting the floss during periods of non-use. Other prior devices have been difficult to use due to the fact that the dispensing of new floss is a complicated procedure due to the complex construction of such devices.

Therefore, it is the primary object of this invention to provide a new and improved tooth cleaning appliance.

Another object of this invention is the provision of new and improved tooth cleaning means employing both dental floss and brush components.

Yet another object of the invention is the provision of new and improved tooth cleaning means that enable the use of tightly tensioned dental floss which can easily be replaced and which also alternatively enables the use of a toothbrush, with the parts not being used at any particular time being stored in sanitary protected environments.

Achievement of the foregoing objects is enabled by this invention through the provision of an elongated handle member comprising a cylindrical shell having axial storage compartments separated by a center wall and including a forwardly extending implement support member threadably received in one end of the cylindrical portion. A dental floss passageway extends outwardly through the implement support member and a dental floss tensioning pin is mounted for reciprocation in a transverse opening in the implement support member so that dental floss extending about a Y-shaped support member threadably received in the outer end of the implement support member can be engaged with the pin. The pin is then axially moved inwardly of the implement support member to tension the floss engaging the pin extending about the Y-shaped means.

The tensioning pin includes a V-shaped cutting portion in a head flange portion of the pin externally of the implement support member so that used dental floss can be easily severed from a new strand of dental floss introduced over the Y-shaped supporting means.

A significant aspect of the invention resides in the specific construction of the Y-shaped supporting and tensioning member which is unitarily formed of plastic and comprises two spreader arms joined at a flexible hinge portion at the apex of the arms with a support stem extending away from the apex. The outer end of the support stem is threaded on its outer periphery and includes a bisecting cut extending through its axis up to a position adjacent the bent hinge portion so that the spreader arms can be moved together with a consequent outward movement of the half-cylinder portion of the support stem to reduce the overall dimensions of the Y-shaped means so that it can be accommodated in the implement storage chamber in the cylindrical sleeve portion of the handle.

Another aspect of the invention involves the provision of a toothbrush head having a threaded end portion dimensioned to be threadably received in the outer end of the implement support member and being dimensioned to be stored in the implement storage compartment during periods of non-use.

A better understanding of the subject invention will be achieved when the following written description of the preferred embodiment is read in conjunction with the appended drawings in which:

FIG. **1** is a perspective view of the preferred embodiment of the invention assembled with the dental floss supporting and tensioning means in position for use;

FIG. **2** is a perspective view of the preferred embodiment assembled with a toothbrush head in position for use;

FIG. **3** is an exploded perspective view of the preferred embodiment of FIG. **1**;

FIG. **4** is a top plan view of the embodiment as assembled in FIG. **1**;

FIG. **5** is a sectional view taken along lines **5—5** of FIG. **4**;

FIG. **6** is a sectional view taken along lines **6—6** of FIG. **5** illustrating the tensioning pin in its inward or dental floss tensioning position;

FIG. **7** is a sectional view similar to FIG. **6** but illustrating the dental floss tensioning pin in its outer or non-tensioning position; and

FIG. **8** is a bisecting sectional view of the implement storage compartment illustrating the manner in which the Y-shaped dental floss tensioning member is stored therein.

Attention is initially invited to FIG. **1** of the drawings in which the preferred embodiment, generally designated **10,** is illustrated in assembled condition for employment of a strand of dental floss **12** for use in a tooth cleaning operation. The preferred embodiment includes a handle member comprising a cylindrical shell **20** and a forwardly extending implement support member **22.**

Cylindrical shell **20** is divided by a medial wall **24** (FIGS. **5** & **8**) into a dental floss storage chamber or compartment **26** and an implement storage chamber or compartment **28** as best shown in FIG. **5.** Implement storage chamber **28** is provided with a plurality of vent openings **30** for enabling the drying of a toothbrush head **32** dimensioned to be stored in the implement storage chamber as shown in FIG. **5.** An end cover cap **34** snaps over the outer end of the cylindrical shell **20** for maintaining the toothbrush head **32** inside the shell but can easily be removed for enabling removal of the toothbrush head from the implement storage chamber **28** in an obvious manner.

The forward end of the cylindrical shell **20** is provided with internal threads **36** forwardly of the dental floss storage chamber **26** and in which a cylindrical threaded end portion **38** of the implement support member **22** is received.

Implement support member **22** includes a dental floss guide passageway **40** through which dental floss **12** extends from a roll of dental floss **42** in the dental floss storage chamber **26.** A transverse aperture is provided through the implement support member **22** for supporting a floss tensioning pin means **44** with the trans-

verse opening comprising a conical upper portion **46** and a cylindrical lower portion **48** as best illustrated in FIG. **6.**

Tensioning pin means **44** comprises a first cylindrical portion **50** terminating inwardly in a radial flat plane surface **52.** A tapered conical portion **54** has its smallest diameter end portion adjacent the radial plane surface **52** and extends downwardly through a point at which its larger diameter portion merges with a second cylindrical portion **56.** A head flange **58** is connected to the upper end of the first cylindrical portion **50** and includes a V-shaped cutting notch **60** having sharp edges **62** on which floss can be cut.

An internally threaded implement mounting aperture **64** is provided in the outer end of the implement support member **22** for receiving either a Y-shaped floss supporting and tensioning means **66** illustrated in FIG. **1** or the toothbrush head **32** illustrated in FIGS. **2** and **5.**

Connection of the toothbrush head **32** to the internally threaded aperture **64** is enabled by a threaded stem portion **68** provided on the end of the toothbrush head as best shown in FIG. **5.**

The Y-shaped supporting and tensioning means **66** includes first and second spreader arms **70** each notched at its outer end for receiving dental floss **12.** Spreader arms **70** join at an apex defined by a thin hinge portion **72** from which a support stem **74** extends. Support stem **74** includes an outer externally threaded cylindrical connector portion **76** formed of two half-cylinders **76'** (FIG. **8**) formed due to the fact that the support stem **74** and its connector portion **76** are bisected axially along a line **78** up to the hinge portion **72.** The foregoing construction enables the spreader arms **70** to move inwardly about hinge **72** while the half-cylinder portions **76** move outwardly to provide a resultant configuration illustrated in FIG. **8** which enables storage of the Y-shaped support and tensioning means in the implement storage chamber **28.**

When using the preferred embodiment with the dental floss supporting and tensioning means as illustrated in FIG. **1,** dental floss **12** is pulled outwardly from the guide passageway **40** past the floss tensioning pin **44** which is in its outer or extended position illustrated in FIG. **7** so that the floss extends abuttingly against the radial flange **52** and the tapered conical surface **50** as shown in FIGS. **7** and **4.** The floss also extends upwardly about the outer ends of the spreader arms **70** through the slots in the outer ends of the arms **70** with the end **12'** of the floss extending under the radial flange **52** in the manner illustrated in FIGS. **4** and **7.** The tensioning pin **44** is then moved from the position illustrated in FIG. **7** downwardly into the position illustrated in FIG. **6** with this movement serving to tension the floss and hold it in the position illustrated in FIGS. **1** and **4.**

There is sufficient frictional engagement of the pin **44** and the floss on the pin with the cylindrical surface **48** of the transverse opening extending through the implement support member **22** to maintain the pin **44** in the position illustrated in FIG. **6** so that the floss is maintained in a taut condition. Should it be desired to replace the floss, the pin **44** is then moved into the FIG. **7** position and a new length of floss is pulled from the roll **42** outwardly through the guide passageway **40** and positioned against the pin in the previously discussed manner. The previously used floss can be cut off by positioning the floss in the notch **60** followed by a tensioning of the floss so that the sharp edges **62** sever the floss in a manner that will be apparent.

Additionally, should the floss become lodged between the teeth of the user so as to be difficult to remove in a direction transverse to the axis of the floss between arms **70,** pin **44** can be moved to the FIG. **7** position to release the floss so that it can then be withdrawn lengthwise from between the user's teeth.

when it is desired to use the toothbrush head **32,** the Y-shaped support and tensioning member **66** is removed from the implement supporting means **22** and the toothbrush head **32** is threaded into the aperture **64.** During usage of the toothbrush head **32,** the Y-shaped tensioning and support means **66** can be positioned in the implement storage chamber **28** as shown in FIG. **8.**

Therefore, it will be appreciated that the subject invention provides an easily used, economical to manufacture tooth cleaning implement of substantial versatility. While numerous modifications will undoubtedly occur to those of skill in the art, it should be understood that the spirit and scope of the invention is to be limited solely in light of the appended claims.

I claim:

1. A manually held device for enabling the removal of food particles from the teeth of a user, said device comprising an elongated handle member, a dental floss storage compartment in the interior of said handle member for storing a supply of dental floss, a supply of dental floss in said dental floss storage compartment, a Y-shaped dental floss supporting and tensioning means including first and second spreader arms flaring outwardly from a support stem portion, an implement storage chamber in the interior of said handle member for storing said Y-shaped dental floss supporting and tensioning means, connecting means for removably attaching said support stem to one end of said handle member, a dental floss tensioning pin including a dental floss holding portion engageable with dental floss extending from said Y-shaped means, pin support means in said handle member supporting said dental floss tensioning pin for axial movement between an extended position in which said dental floss holding portion is exposed externally of said handle so that the portions of a length of dental floss extending from said dental floss storage compartment across said spreader arms can be engaged with said dental floss holding portion and an inward floss tensioning position in which the dental floss holding portion is positioned inwardly of said handle so that dental floss engaging said holding portion when said pin is in its extended position is tensioned by movement of said pin to its inward position.

2. The invention of claim **1** wherein said dental floss tensioning pin comprises first and second axially spaced coaxial cylindrical portions, a tapered conical portion connecting said first and second cylindrical portions coaxially between said cylindrical portions, said tapered conical portion having a larger end adjacent the innermost end of said second cylindrical portion and a smaller end terminating in a radial plane surface defining the innermost extent of said first cylindrical portion, said radial surface and said tapered conical surface comprising said dental floss holding portion of said pin, a head flange extending radially outwardly from the outer end of said first cylindrical portion externally of said handle member and a base flange ex-

tending radially outwardly from the outer end of said second cylindrical portion externally of said handle member on the opposite side of said handle member from said head flange, wherein said support means in said handle supporting said dental floss tensioning pin comprises a transverse passageway extending through said handle defined by an inwardly tapering conical surface extending inwardly in a converging manner from the side of said handle adjacent said head flange and terminating medially of said handle and a cylindrical surface of a diameter approximately equal the diameter of said second cylindrical portion extending from the inner termination of said conical portion to the opposite side of said handle adjacent said base flange.

3. The invention of claim **1** wherein said first cylindrical portion and said conical surface in said handle are of approximately the same axial length.

4. The invention of claim **3** additionally including an inwardly extending V-shaped slot in said head flange having sharp edges for enabling the severing of said dental floss.

5. The invention of claim **4** wherein said handle member comprises a cylindrical sleeve having a threaded aperture in one end and an elongated implement support member having a base end threadably received in said threaded aperture in said cylindrical sleeve and an outer end having an internally threaded implement attachment recess and further including a toothbrush head having a threaded rod end threadably receivable in said implement attachment recess, said toothbrush head being dimensioned to be received in said implement storage chamber.

6. The invention of claim **5** wherein said Y-shaped dental floss supporting and tensioning means is formed unitarily of plastic material, said stem portion is split along its axis and includes a split cylindrical end member having threads on its outer surface dimensioned to be threadably receivable in said implement attachment recess and split along an axial plane into two half-cylinders, a flexible hinge portion defining a junction between said flaring arms and said half-cylinders, said flexible hinge portion being relatively thin so that said flaring arms can be bent to move toward each other to permit said Y-shaped means to be received in said implement storage chamber.

7. The invention of claim **6** additionally including a radial wall formed internally of said cylindrical sleeve and separating said dental floss storage compartment and said implement storage chamber.

8. The invention of claim **7** additionally including a dental floss guide passageway extending through said implement support member from the base end of said implement support member and having an outer termination adjacent said head flange of said pin whereby a strand of dental floss from a body of dental floss stored in said dental floss storage compartment can be pulled outwardly from said compartment for attachment to said Y-shaped support and engagement with said tensioning pin.

9. The invention of claim **8** additionally including floss guide slots in the outer ends of said spreader arms.

10. The invention of claim **9** wherein said tensioning pin is formed of metal.

* * * * *