Oct. 9, 1956 E. H. BLOOM ET AL 2,765,534

TOOTH COLOR GUIDE

Filed Jan. 21, 1955 3 Sheets-Sheet 1

Fig. 1.

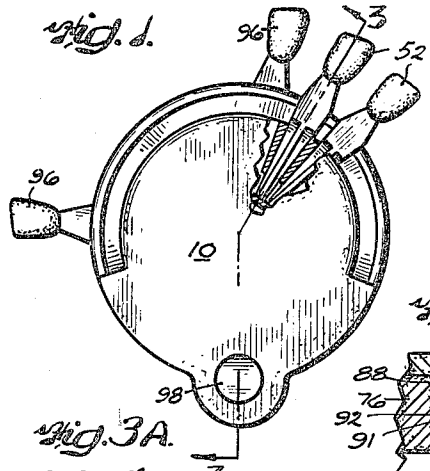


Fig. 2.

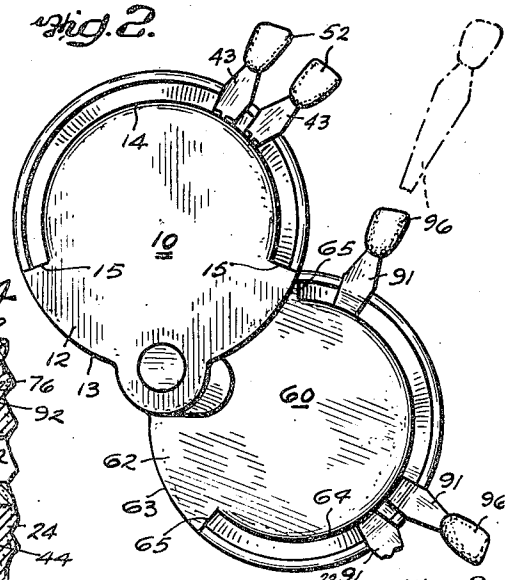


Fig. 4

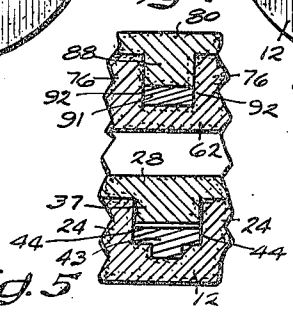


Fig. 3A.

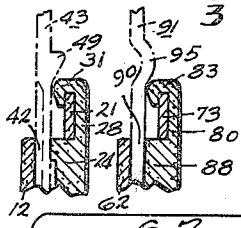


Fig. 5

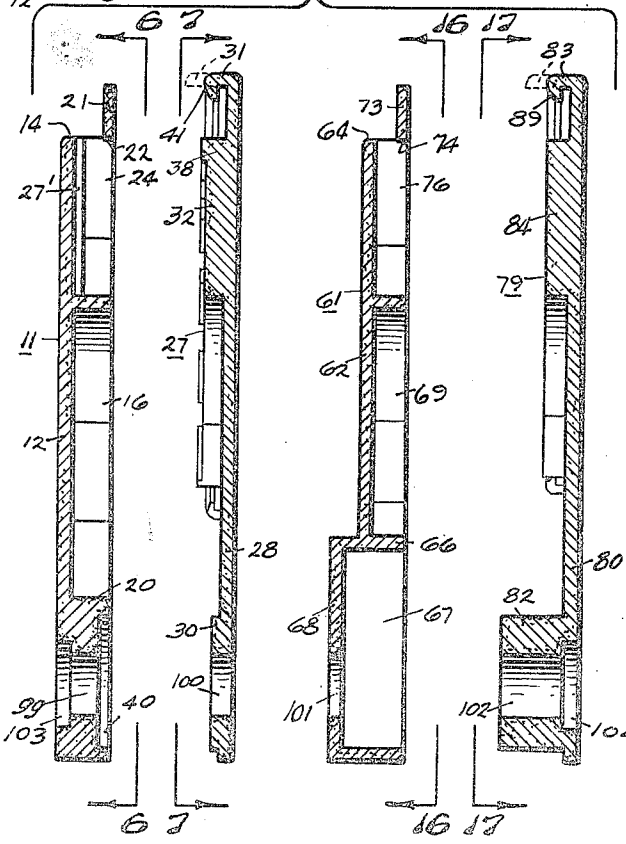
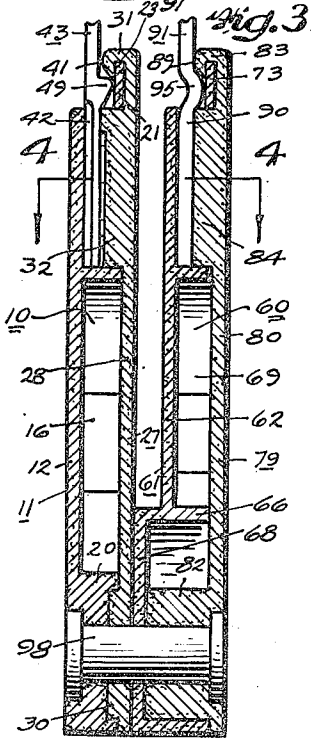


Fig. 3



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Oct. 9, 1956 E. H. BLOOM ET AL 2,765,534

TOOTH COLOR GUIDE

Filed Jan. 21, 1955 3 Sheets-Sheet 2

Fig. 6.

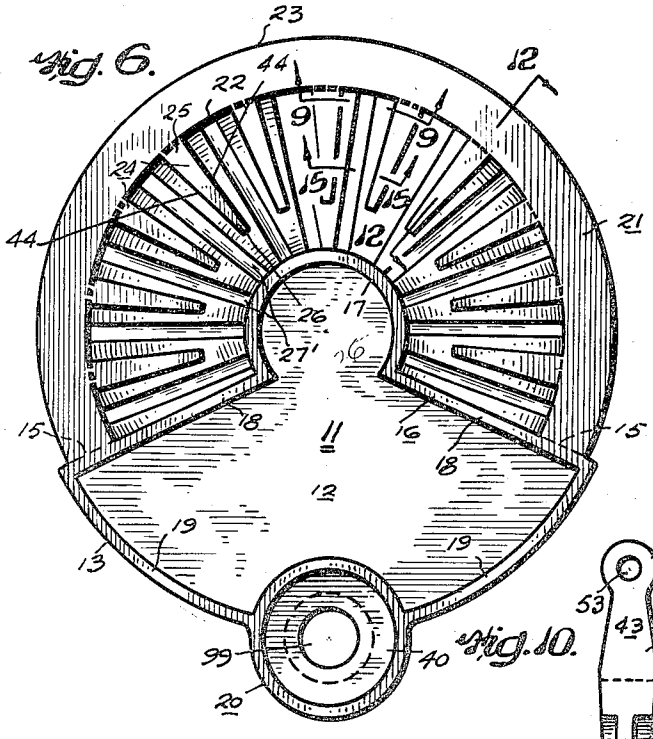


Fig. 8.

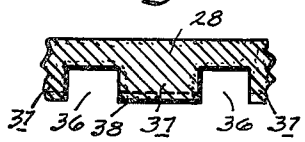


Fig. 9.

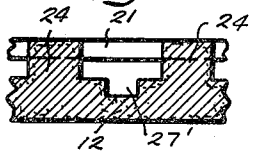


Fig. 10.

Fig. 11. Fig. 12.

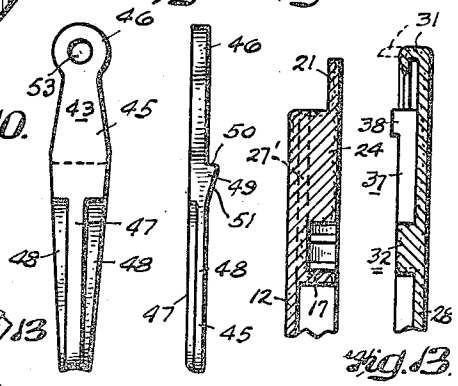


Fig. 13.

Fig. 7.

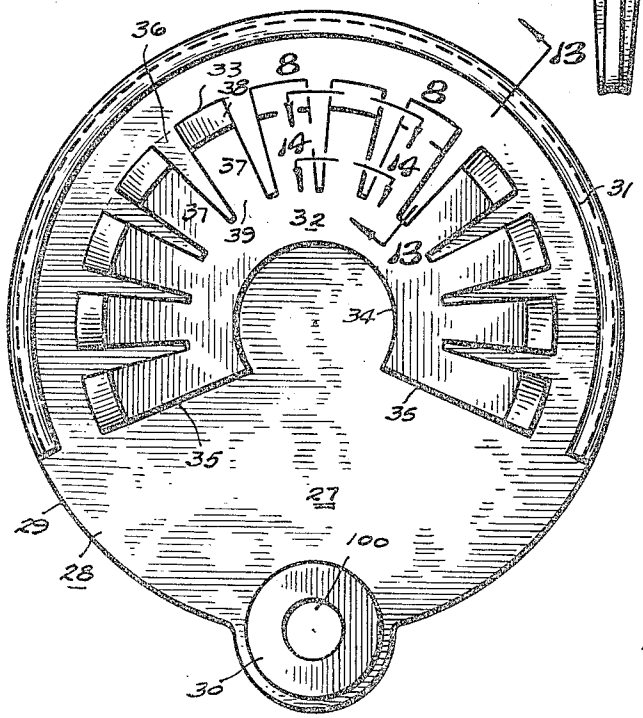


Fig. 14.

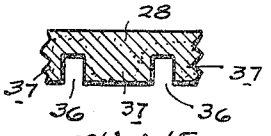
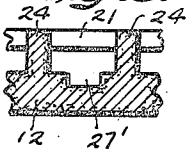


Fig. 15.



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Oct. 9, 1956 E. H. BLOOM ET AL 2,765,534

TOOTH COLOR GUIDE

Filed Jan. 21, 1955 3 Sheets-Sheet 3

Fig. 16.

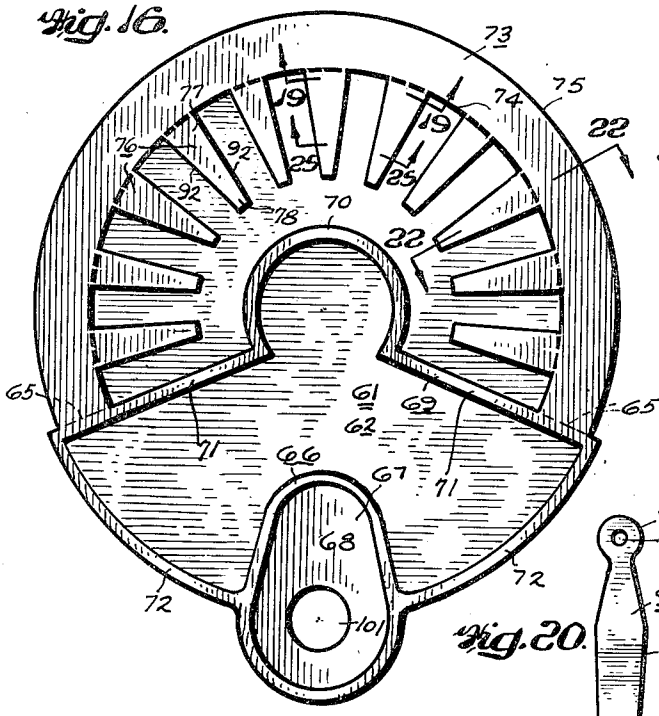


Fig. 18.

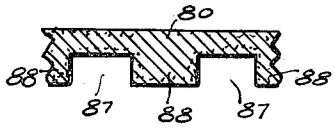


Fig. 19.

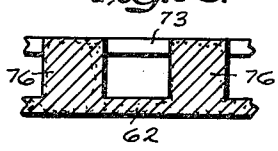


Fig. 20.

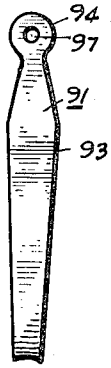


Fig. 21

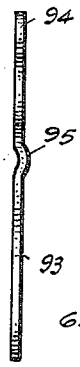


Fig. 22

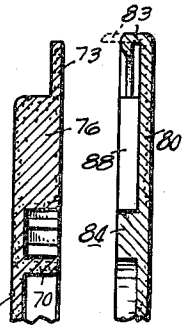


Fig. 23.

Fig. 17

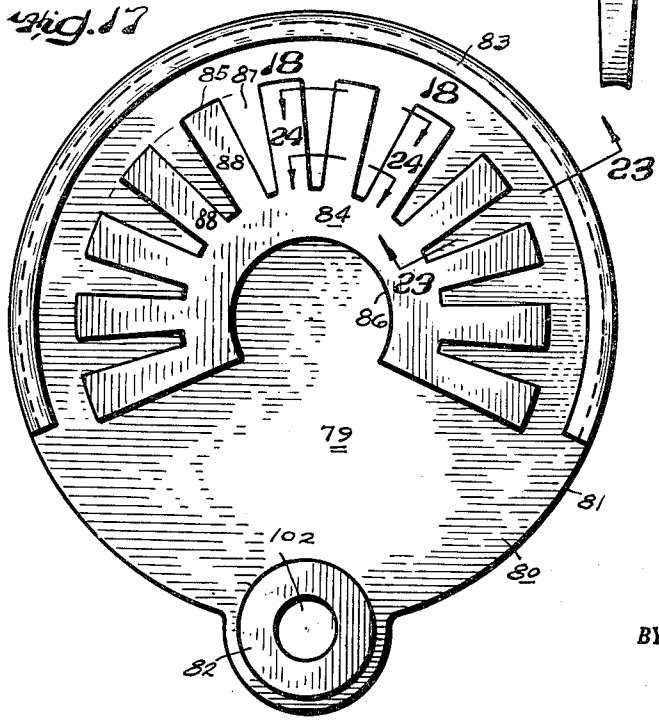


Fig. 24.

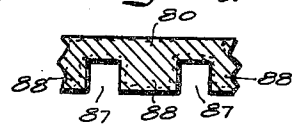
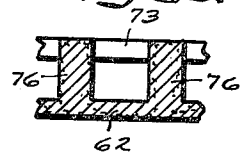


Fig. 25.



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2,765,534

TOOTH COLOR GUIDE

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Application January 21, 1955, Serial No. 483,241

5 Claims. (Cl. 32—71)

This invention relates generally to dental devices and is concerned more particularly with a tooth shade guide employed by dentists in determining by comparison the particular shade of artificial stock teeth that may be substituted for the natural teeth of the patient.

A principal object of the present invention is to provide an improved tooth shade guide wherein as the tooth mounting members are racked in the holder they are automatically secured against accidental displacement by the interengagement of means associated directly respectively with the tooth mounting members and the main body of the holder, without the intervention of any auxiliary member, such as, for example, a spring.

Another object of the present invention is to provide such a tooth shade guide in the form of a plural number of holders each of which may be used separately, and all of which may be used as a unitary device wherein the holders may be fanned out when in use and compactly stacked when not in use.

Still another object of the present invention is to provide such a tooth shade guide which is exceedingly simple in design and construction and which is comparatively simple and inexpensive to manufacture.

Other objects and advantages of the present invention will appear more fully hereinafter, it being understood that said invention consists substantially in the combination, construction, location and general arrangement of parts, all as described in detail in the following specification, as shown in the accompanying drawings and as fully pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a front elevation of a tooth shade guide embodying the present invention, the device being shown in its stacked condition when not in use;

Figure 2 is the same as Figure 1 but the device is shown in its expanded or fanned out condition when in use;

Figure 3 is a vertical section on line 3—3 of Figure 1;

Figure 3A is a fragmentary view similar to Figure 3 showing in broken lines the tooth mounting members only partially engaged with the holders;

Figure 4 is an enlarged horizontal section on line 4—4 of Figure 3;

Figure 5 is similar to Figure 3 but shows, in disassembled condition, only the main body parts of the holders;

Figures 6 and 7 are views looking at the surfaces of the main body parts of the forwardmost holder, being elevations respectively on lines 6—6 and 7—7 of Figure 5;

Figures 8 and 9 are enlarged sections respectively on line 8—8 of Figure 7 and line 9—9 of Figure 6;

Figure 10 is a front elevation of a tooth mounting member for use with the forwardmost holder;

Figure 11 is a side elevation of the tooth mounting member shown in Figure 10;

Figures 12 and 13 are radial sections respectively on line 12—12 of Figure 6 and line 13—13 of Figure 7;

Figures 14 and 15 are enlarged sections respectively on line 14—14 of Figure 7 and line 15—15 of Figure 6;

Figures 16 and 17 are views looking at the opposed surfaces of the main body parts of the rearwardmost holder, being elevations respectively on lines 16—16 and 17—17 of Figure 5;

Figures 18 and 19 are enlarged sections respectively on line 18—18 of Figure 17 and line 19—19 of Figure 16;

Figure 20 is a front elevation of a tooth mounting member for use with the rearwardmost holder;

Figure 21 is a side elevation of the tooth mounting member shown in Figure 20;

Figures 22 and 23 are radial sections respectively on line 22—22 of Figure 16 and line 23—23 of Figure 17; and

Figures 24 and 25 are enlarged sections respectively on lines 24—24 of Figure 17 and line 25—25 of Figure 16.

Referring to the drawings, and particularly to Figures 1 through 15, the tooth shade guide of the present invention comprises a holder designated 10 which has a generally circular cover plate designated 11. The cover plate 11 has a relatively thin principal wall area designated 12 which is bounded by a peripheral bottom edge 13 that extends through an arc of approximately 140°, and by a peripheral top edge 14 that extends through a reduced radius arc of approximately 220° and terminates in outwardly extending peripheral edges 15—15 connecting the top edge 14 with the bottom edge 13.

Extending rearwardly from the wall area 12 perpendicularly to the plane thereof is a rib designated 16 which arches about the center of the cover plate 11 through an arc of approximately 220°, as at 17; diverges along straight lines downwardly and outwardly in opposite directions along the edges 15—15 of the wall area 12, as at 18—18; and then converges downwardly and inwardly in opposite directions along the bottom edge 13 of the wall area 12, as at 19—19, finally merging with a round boss 20 that extends rearwardly from the bottommost portion of the wall area 12 perpendicularly to the plane thereof. The section of the wall area 12 disposed above the arcuate rib portion 17 and the contiguous rib portions 18—18 is referred to hereinafter as the upper section of the wall area 12, while the section of the wall area 12 below the rib portions aforesaid is referred to as the lower section of the wall area 12.

Extending over the top and downwardly on opposite sides of the upper section of the wall area 12 in a plane parallel to and disposed in rearwardly spaced relation to the wall area 12 is an auxiliary wall area 21 the inner peripheral edge 22 of which extends along an arc having substantially the same radius as the top edge 14 of the upper section of the wall area 12, and the outer peripheral edge 23 of which extends along an arc having a radius somewhat shorter than that of the bottom edge 13 of the wall area 12. While the outer edge 23 of the arcuately shaped wall area 21 is continuous, the inner edge 22 is interrupted by a number of identical elongated elements 24 that project rearwardly from the inner surface of the upper section of the wall area 12 and extend radially inwardly from the arcuately shaped wall area 21. The elements 24 have broad outer end portions 25 and taper uniformly to relatively narrow blunt inner end portions 26 disposed a substantial distance from the arcuate portion 17 of the rib 16. Referring particularly to Figure 6, the opposite end portions of the arcuately shaped wall area 21 merge respectively with the straight portions 18—18 of the rib 16 so that the rearwardly presenting or under surfaces of the arcuately shaped wall area 21 and the rib 16, the boss 20 and the several tapered elements 24 are coplanar. Alternately arranged with the several tapered elements 24 and the straight portions 18—18 of the rib 16 are a number of keyways designated 27' that are formed in the rearwardly presenting, relatively depressed surface of the upper section of the wall

area 12, which keyways extend from the top edge 14 thereof radially inwardly to the arcuately shaped portion 17 of the rib 16.

The holder 10 also has a generally circular body member designated 27. The body member 27 has a relatively thin flat principal wall area 28 which is bounded by a peripheral edge 29. Projecting forwardly from a bottommost portion of the wall area 28 is a round boss 30; projecting forwardly from an outer marginal portion of the wall area 28 is a flange 31 which extends through an arc of approximately 220°; and projecting forwardly from an inner portion of the wall area 28 is a thick wall area 32. An outer peripheral edge 33 of the wall area 32 extends along an arc of approximately 220°, and an inner peripheral edge 34 of the wall area 32 likewise extends along an arc of approximately 220°, terminating in outwardly extending peripheral edges 35—35 connecting the outer edge 33 with the inner edge 34. While the inner edge 34 is continuous, the outer edge 33 is interrupted by a number of identical elongated recesses 36 that extend radially inwardly. The recesses 36 are broad at their outer ends and taper uniformly to relatively narrow blunt inner ends disposed a substantial distance from the inner edge 34 of the thick wall area 32, there being formed thereby a number of elongated corresponding tapered elements designated 37 that extend radially outwardly from the inner marginal portion of the thick wall area 32. The outer ends of these tapered elements 37 are thickened to provide portions 38 raised somewhat above the surface of the inner portions 39 thereof.

Referring particularly to Figures 5 and 13, before assembly of the body member 27 with the cover plate 11, the flange 31 of the body member 27 projects forwardly in its entirety perpendicularly to the plane of the wall area 28, as shown in broken lines. When the body member 27 and the cover plate 11 are fitted one to the other and preliminarily to being permanently secured together, the arcuately shaped wall area 21 of the cover plate 11 is received in the complementally shaped space between the wall area 32 and the flange 31 of the body member 27; the wall area 32 of the body member 27 is received in the complementally shaped space defined by arcuately shaped wall area 21 of the cover plate 11 and the rib 16 of the cover plate 11, the several elongated elements 24 of the cover plate 11 being received in the several complementally shaped recesses 36 of the body member 27; and the boss 30 of the body member 27 is received in a complementally shaped recess 40 formed in the boss 20 of the cover plate 11. Referring particularly to Figure 3, after the body member 27 and the cover plate 11 are fitted together in the manner just described, the flange 31 of the body member 27 is turned inwardly over the outer edge 23 of the cover plate's arcuately shaped wall area 21, the body member 27 and the cover plate 11 being thereby permanently secured together with the coplanar rearwardly presenting or under surfaces of the cover plate 11, referred to hereinbefore, abutting the forwardly presenting surface of the wall area 28 of the body member 27, and with the bottom edge 13 of the cover plate 11 in registry with the corresponding portion of the edge 29 of the body member's wall area 28. The turned down flange 31 is curved, as at 41, and the height of the flange 31 measured from the rearwardly presenting or under surface of the body member 27 corresponds substantially to the thickness of the body member 27 measured through the outer end portion 38 of an elongated element 37 of the body member 27.

The holder 10 which is formed by permanently securing together the body member 27 and the cover plate 11 is provided with a series of radially extending openings 42 adapted to receive the shanks of a group of tooth mounting members 43, to be described hereinafter. Referring particularly to Figures 3 and 4, throughout the major portion of their lengths the several openings 42 are defined by the forwardly presenting surface of the inner comparatively thin portions of the body member wall area 32, rearwardly presenting surface of the upper section of the cover plate wall area 12, and the several tapering surfaces of the elongated elements 24 designated 44 and corresponding surfaces of the straight rib portions 18—18 of the cover plate 11. The entrances to the openings 42 are slightly restricted due to the increased thickness of the outer end portions 38 of the body member elongated elements 37.

Referring to Figures 10 and 11, the tooth mounting members 43 are generally flat elongated members each having a shank 45 surmounted by a head 46. The shank 45 is comparatively broad through its middle and tapers uniformly to a narrower width at the head 46, and likewise to a narrower width at its lower end. The lower end portion of the shank 45 is recessed along its opposite sides so as to form a central longitudinally extending key 47 and comparatively thin wall areas 48—48 flanking the key 47. Extending across the shank 45 just above the thin wall areas 48—48 is a rearwardly projecting protuberance 49 having an upwardly presenting ledge 50 and a contiguous surface 51 sloping downwardly and inwardly from the ledge 50. The tooth 52 to be displayed is pivotally secured to the head 46 of the mounting member 42, as by a pin (not shown) projected through a hole 53 formed in the head 46.

Referring particularly to Figure 3A, in order to insert a tooth mounting member 43 into the holder 10, the tooth mounting member 43 is axially aligned with a selected opening 42 in the holder 10 and then moved axially thereinto. Initially, the shank 45 of the mounting member 43 only moves to the broken line position shown, but subsequent movement forces the shank 45 to flex slightly as the sloping surface 51 of the protuberance 49 passes over the curved surface 41 of the flange 31. Referring particularly to Figure 3, as the tooth mounting member 43 approaches full engagement with the holder 10, the protuberance 49 automatically snaps under the flange 31. The key 47 formed on the shank 45, of course, is received by the keyway 27' formed in the cover plate wall area 12, while the tapering thin wall areas 48—48 of the shank 45 are received between the correspondingly tapered opposed sides 44—44 of the adjacent pair of elongated elements 24—24 of the cover plate 11. In addition, the shank 45 of the mounting member 43 is of such a length that, when fully engaged with the holder 10, the lower end thereof abuts the arcuately shaped rib portion 17 of the cover plate 11, the tooth 52 mounted on the opposite end of the mounting member 43 being held out beyond the periphery of the holder 10 in plain view, as shown in Figures 1 and 2. It will be apparent that the tooth mounting member 43 is secured against axial displacement in one direction by the aforesaid rib portion 17, and is secured against accidental axial displacement in the opposite direction by the aforesaid flange 31, which engages the protuberance 49 formed on the shank 45. In order to remove the tooth mounting member 43 from the holder 10, it is merely necessary to grasp the top thereof and to pull outwardly with sufficient force to cause the protuberance 49 formed on the shank 45 to move outwardly in contact with the curved surface 41 of the flange 31. After the protuberance 49 has passed the flange 31, the tooth mounting member 43 may be moved freely without further resistance, to fully disengage the same from the holder 10.

Now, referring particularly to Figures 2, 3, 3A, 4, 5 and 16 through 25, the tooth shade guide of the present invention additionally comprises a holder designated 60 which has a cover plate designated 61. The cover plate 61 has a principal wall area designated 62 which is bounded by a bottom edge 63, a top edge 64 and edges 65—65. At the bottommost portion of the wall area 62 is a rib 66 disposed perpendicularly to the plane of and extending both forwardly and rearwardly from the wall area 62. The rib 66 defines a generally oval opening

designated 67 one end of which is closed by an end wall 68 disposed in forwardly spaced parallel relation to the wall area 62. To the rear of the wall area 62 are a rib 69 the component parts of which are designated 70, 71—71, and 72—72, the rib parts 72—72 merging with the rib 66 aforesaid; a wall area 73 which has an inner edge 74 and an outer edge 75; and a series of elements 76 which have outer end portions designated 77 and inner end portions designated 78. Referring particularly to Figure 16, the rearwardly presenting or under surfaces of the wall area 73 and the rib 69, the rib 66 and the several elements 76 are coplanar.

The holder 60 also has a body member designated 79. The body member 79 has a principal wall area 80 which is bounded by an edge 81. In front of the wall area 80 are a boss 82, a flange 83 and a wall area 84, which has an outer edge 85 and an inner edge 86. The wall area 84 is recessed as at 87 to form a number of elongated elements designated 88.

The cover plate 61 and the body member 79 of the holder 60 are assembled in the manner already described for assembling the cover plate 11 and the body member 27 of the holder 10. Except as indicated hereinabove, the holder 60 is the same in all essential respects as the holder 10, in consequence of which a further detailed description of structural features and the manner of assembly is believed to be unnecessary for a full understanding of the present invention. However, it should be noted that the boss 82 is received in the enlarged portion of the oval opening 67 at the base of the rib 66, the turned down flange 83 is curved as at 89, and the height of the flange 83 measured from the rearwardly presenting or under surface of the body member 79 corresponds substantially to the thickness of the body member 79 measured through an elongated element 88. In addition, it will be noted that the elongated member 88 is of uniform thickness throughout its entire length, and that no keyways are provided in the principal wall area 62 between the elongated elements 88. Furthermore, the holder 60 which is formed by permanently securing together the body member 79 and the cover plate 61 is provided with a series of radially extending openings 90 adapted to receive the shanks of a group of tooth mounting members 91, to be described hereinafter. Referring particularly to Figures 3 and 4, the several openings 90 are defined by the forwardly presenting surface of the body member wall area 84, the rearwardly presenting surface of the upper section of the cover plate wall area 62, and the several tapering surfaces of the elongated elements 76 designated 92 and corresponding surfaces of the rib portions 71—71 of the cover plate 61.

Referring to Figures 20 and 21, the tooth mounting members 91 are generally flat elongated members each having a shank 93 surmounted by a head 94. The shank 93 is comparatively broad through its middle and tapers uniformly to a narrower width at the head 94, and likewise to a narrower width at its lower end. Extending across the shank 93 just below its broadest part is a rearwardly projecting rounded protuberance 95. The tooth 96 to be displayed is pivotally secured to the head 94 of the mounting member 91, as by a pin (not shown) projected through a hole 97 formed in the head 94.

Referring particularly to Figure 3A, in order to insert a tooth mounting member 91 into the holder 60, the tooth mounting member 91 is axially alined with a selected opening 90 in the holder 60 and then moved axially thereinto. Initially, the shank 93 of the mounting member 91 only moves to the broken line position shown, but subsequent movement forces the shank 93 to flex slightly as the rounded protuberance 95 passes over the curved surface 89 of the flange 83. Referring particularly to Figure 3, as the tooth mounting member 91 approaches full engagement with the holder 60, the protuberance 95 automatically snaps under the flange 83. The tapering sides of the lower end of the shank 93 are received between

the correspondingly tapered opposed sides 92—92 of the adjacent pair of elongated elements 76—76 of the cover plate 61. In addition, the shank 93 of the mounting member 91 is of such a length that, when fully engaged with the holder 60, the lower end thereof abuts the arcuately shaped rib portion 70 of the cover plate 61, the tooth 96 mounted on the opposite end of the mounting member 91 being held out beyond the periphery of the holder 60 in plain view, as shown in Figures 1 and 2. It will be apparent that the tooth mounting member 91 is secured against axial displacement in one direction by the aforesaid rib portion 70, and is secured against accidental axial displacement in the opposite direction by the aforesaid flange 83, which engages the protuberance 95 formed on the shank 93. In order to remove the tooth mounting member 91 from the holder 60, it is merely necessary to grasp the top thereof and to pull outwardly with sufficient force to cause the protuberance 95 formed on the shank 93 to move outwardly in contact with the curved surface 89 of the flange 83. After the protuberance 95 has passed the flange 83, the tooth mounting member 91 may be moved freely without further resistance, to fully disengage the same from the holder 60.

The holders 10 and 60 are secured together by a tubular eyelet or a rivet 98 projected through alined apertures 99 in the boss 20 of the cover plate 11 and 100 in the boss 30 of the body member 27, 101 in the wall area 68 of the cover plate 61 and 102 in the boss 82 of the body member 79. The upset opposite end portions of the element 98 are received in recesses formed in the forwardly presenting surface of the cover plate 11 and the rearwardly presenting surface of the body member 79, designated respectively by the numerals 103 and 104. When secured together as aforesaid, the holder 10 is positioned in advance of the holder 60 so as to substantially overlie the latter, with the rearwardly presenting outer surface of its body member 27 disposed substantially flatwise against the forwardly presenting outer surface of the wall area 68 of the cover plate 61. Of course, the holders 10 and 60 may be swung about the axis of the element 98, relative to one another.

Each of the openings 42 in the holder 10 normally accommodates a tooth mounting member 43, and each of the openings 90 in the holder 60 normally accommodates a tooth mounting member 91. The teeth displayed by the holders 10 and 60 of the tooth shade guide may all be of the same material, but normally the teeth displayed by the holder 10 are made of a material different from that of the teeth displayed by the holder 60. For example, those mounted in the holder 10 may be of synthetic plastic, and those mounted in the holder 60 may be of porcelain. In view of the foregoing, it is preferable to provide against any possibility of inserting a tooth mounting member 43 in one of the openings 90 of the holder 60, or a tooth mounting member 91 in one of the openings 42 of the holder 10. To this end, the thickness of the tooth mounting member 43 measured through the key 47 is made greater than the corresponding dimension of the openings 90 in the holder 60, the thickness of the tooth mounting member 91 is made greater than the smaller of the two corresponding dimensions at the entrances to the openings 42 in the holder 10, and the width of the tooth mounting member 91 measured at the lower end thereof is made approximately the same as the width of the keyways 27' in the holder 10. In consequence of the foregoing, the tooth mounting members 43 cannot be accommodated by the holder 60, and the tooth mounting members 91 cannot be accommodated by the holder 10.

In use the tooth shade guide may be fanned out to facilitate the matching process. When not in use, the tooth shade guide may be compactly stacked. In addition the holders 10 and 60 may be constructed as independent units.

It will be understood, of course, that the present in-

vention is susceptible of various changes and modifications which may be made from time to time without involving any departure from the general principles or real spirit thereof. For example, while the holders and the tooth mounting members may be made of synthetic plastic, they may likewise be made of some other material, for example, metal. Accordingly, it is intended to claim the same broadly, as well as specifically, as indicated in the appended claims.

What is claimed as new and useful is:

1. In a tooth shade guide, the combination of a plurality of elongated tooth mounting members, and a disc shaped holder therefor, said holder comprising a body member, and a cover for the latter, said tooth mounting members being disposed between said body member and cover in radially extending angularly spaced openings formed conjointly by said body member and cover, being positioned in side by side relation, and being of a length sufficient for extending outwardly through said openings beyond the periphery of said holder, said tooth mounting members and holder being provided with means for removably securing said tooth mounting members against accidental displacement from said holder, said means being in the form of complementary elements associated respectively with the outer marginal portion of said holder and the portions of said tooth mounting members opposite the same.

2. In a tooth shade guide, the combination of a plurality of elongated tooth mounting members, and a disc shaped holder therefor, said holder comprising a body member, and a cover for the latter, said cover having an outer wall area disposed in overlying relation to a flanged marginal portion of said body member in contact therewith, an inner wall area disposed in overlying spaced relation to the portion of said body member contiguous to said marginal portion of the body member, and means connecting said wall areas and maintaining said inner wall area in the spaced relation aforesaid, said flange being turned inwardly over said outer wall area for securing together said body member and cover, said tooth mounting members being disposed in side by side relation in the space between said body member and inner wall area of the cover, being of a length sufficient for extending radially outwardly beyond said flange, and being provided with protuberances disposed inwardly of said flange and operative to engage the same for removably securing said tooth mounting members against accidental displacement from said holder.

3. In a tooth shade guide, the combination of a plurality of elongated tooth mounting members, and a disc shaped holder therefor, said holder comprising a body member, and a cover for the latter, said covering having an outer wall area disposed in overlying relation to a flanged marginal portion of said body member in contact therewith, an inner wall area disposed in overlying spaced relation to the portion of said body member contiguous to said marginal portion of the body member, and means connecting said wall areas and maintaining said inner wall area in the spaced relation aforesaid, said means being spaced relative to one another to provide entrances to the space between said body member and inner wall area, said flange being turned inwardly over said outer wall area for permanently securing together said body member and cover, said tooth mounting members being disposed in side by side relation in the space between said body member and inner wall area of the cover, being of a length sufficient for extending radially outwardly through said entrances beyond said flange, and being provided with rearwardly projecting protuberances disposed inwardly of said flange and operative to engage the same for removably securing said tooth mounting members against accidental displacement from said holder.

4. In a tooth shade guide, the combination of a plurality of elongated tooth mounting members, and a disc shaped holder therefor, said holder comprising a body member and a cover for the latter, said cover having an outer wall area disposed in overlying relation to a flanged marginal portion of said body member in contact therewith, an inner wall area disposed in overlying spaced relation to the portion of said body member contiguous to said marginal portion of the body member and radially extending angularly spaced means connecting said wall areas and maintaining said inner wall area in the spaced relation aforesaid, said flange being turned inwardly over said outer wall area for permanently securing together said body member and cover, said tooth mounting members being arranged alternately with said angularly spaced means, in the space between said body member and inner wall area of the cover, being of a length sufficient for extending radially outwardly beyond said flange, and being provided with rearwardly projecting protuberances disposed inwardly of said flange and operative to engage the same for removably securing said tooth mounting members against accidental displacement from said holder.

5. In a tooth shade guide, the combination of a multiplicity of elongated tooth mounting members arranged in a plurality of groups, and a disc shaped holder for each group aforesaid, said holders being compactly stacked one over the other and being pivotally secured together to form a unitary device in which the several holders may be fanned out, each of said holders comprising a body member, and a cover for the latter, each group of tooth mounting members being disposed between the associated body member and cover in radially extending angularly spaced openings formed conjointly by said body member and cover, being positioned in side by side relation, and being of a length sufficient for extending outwardly through said openings beyond the periphery of the holder, said tooth mounting members and holders being provided with means for removably securing said tooth mounting members against accidental displacement from said holders, said means being in the form of complementary elements associated respectively with the outer marginal portions of said holders and the portions of said tooth mounting members opposing the same.

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