

[54] **VACUUM HANDPIECE INCLUDING
INTEGRAL VACUUM VALVE**
[75] Inventor: **Donald R. Swatman**, Modesto, Calif.
[73] Assignee: **Den-Tal-Ez Mfg. Co.**, West Des
Moines, Iowa
[22] Filed: **Feb. 22, 1974**
[21] Appl. No.: **444,709**

[52] **U.S. Cl.**..... **128/276, 32/33, 251/353**
[51] **Int. Cl.**..... **A61c 17/04**
[58] **Field of Search** **128/276-278,**
128/351, 350; 32/33; 251/349, 353, 351;
137/286, 318

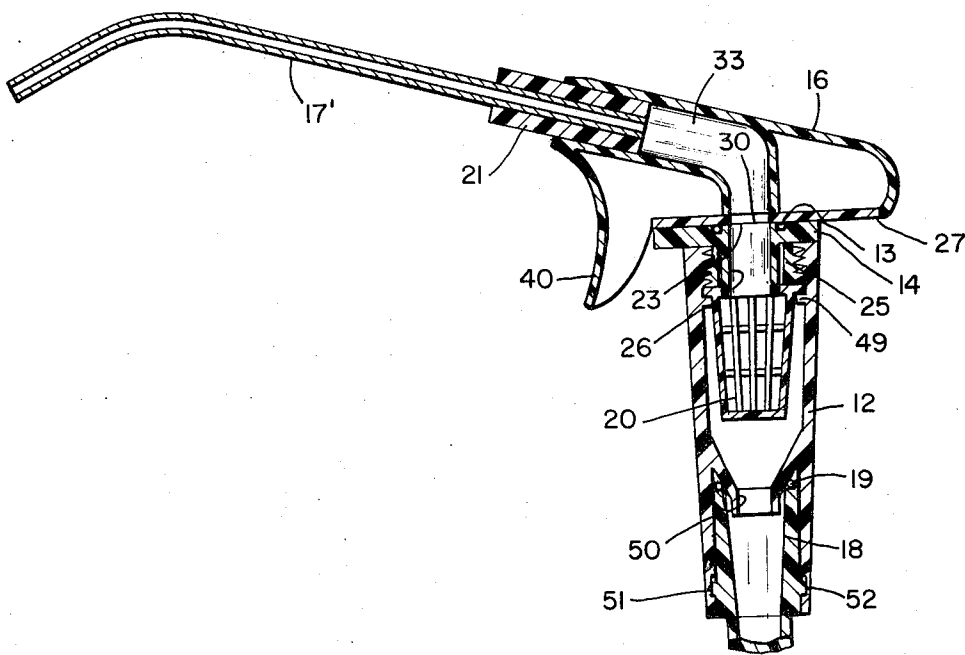
[56] **References Cited**
UNITED STATES PATENTS
711,609 10/1902 Woodnall..... 251/353

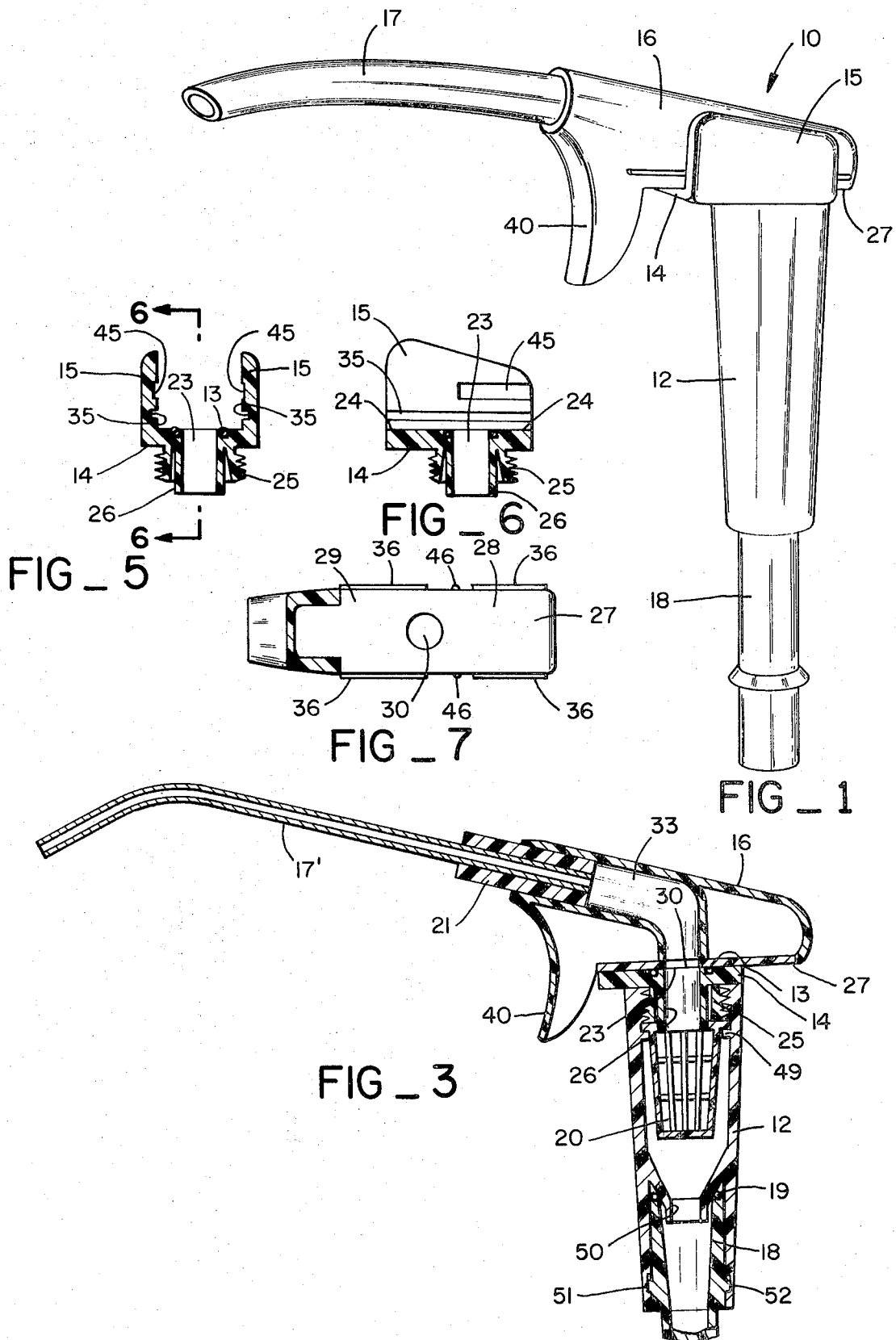
2,711,586 6/1955 Groves..... 32/33
3,232,578 2/1966 Cousins..... 32/33
3,516,160 6/1970 Leffler..... 32/33

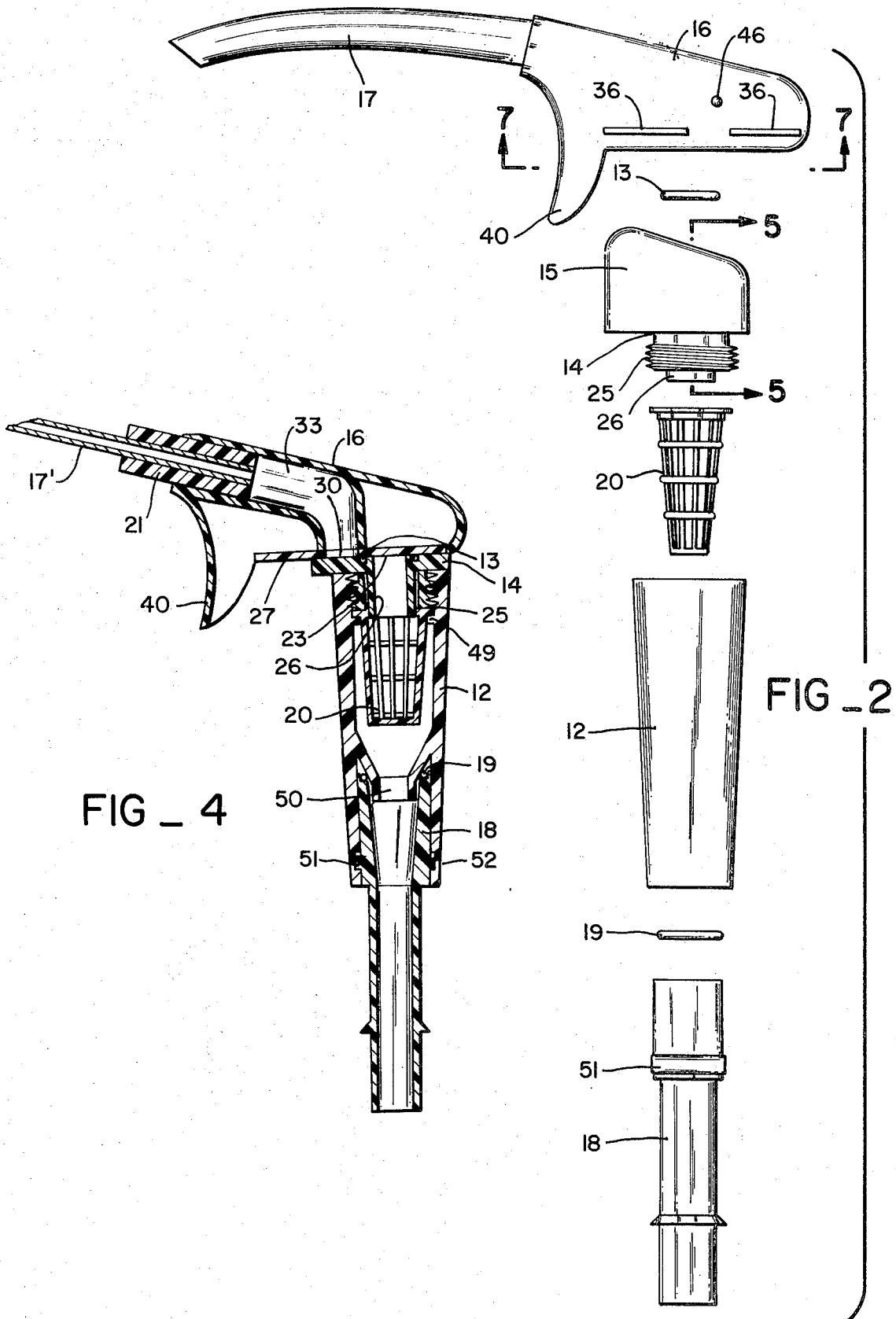
Primary Examiner—Richard A. Gaudet
Assistant Examiner—Henry S. Layton
Attorney, Agent, or Firm—Rudolph L. Lowell

[57] **ABSTRACT**
A novel handpiece specifically adapted for convenience of use in evacuating fluids and small particles from the oral cavity of the human body or the like is disclosed, which handpiece includes a novel vacuum valve for the selective application of suction from a source of low pressure such as a suction pump means. The novel structure of the valve as well as of the handpiece to provide ease of cleaning and maintenance as well as low cost manufacture is described.

10 Claims, 7 Drawing Figures







VACUUM HANDPIECE INCLUDING INTEGRAL VACUUM VALVE

BACKGROUND OF THE INVENTION

This invention relates to apparatus for use in evacuating fluids and small particles during the course of dental and surgical procedures and more particularly to a valve and handpiece specifically adapted for convenience in the selective application of suction forces to the oral cavity in the performance of dental and surgical procedures or to other surgical sites or the like.

The use of handpieces of various types for the application of mechanical energy or fluids in the performance of dental and surgical procedures is well known. A dental drill is an obvious example as well as the so-called "three-way" syringe used in directing a jet of water, air or spray into the oral cavity during the performance of dental or surgical procedures.

It is also well known to use a so-called "saliva ejector" comprising a rigid, generally hook shaped hollow tube of small diameter, attached by means of flexible tubing to a source of low pressure through an appropriate valve, to evacuate liquids from the oral cavity. The saliva ejector is usually hooked over the lower jaw so that its free end extends into the oral cavity to evacuate liquids which collect in the bottom thereof. Although the free end of the saliva ejector is sometimes manually applied to a particular point in the oral cavity to selectively remove liquids, such manual application is inconvenient and uncomfortable for both the doctor or his assistant and the patient.

It has been proposed in U.S. Pat. No. 3,012,322 to provide a separate suction hose of somewhat larger diameter than the usual saliva ejector, having one end connected to a source of low pressure through an appropriate valve and a free end or nozzle adapted to be selectively placed in the oral cavity by the doctor or his assistant in the performance of dental and surgical procedures. However, the free end of a hose is awkward to handle and inconvenient and uncomfortable to use, even if provided with a nozzle.

It is an object of this invention to provide a vacuum handpiece, including an integral valve, for connection to a source of low pressure by means of an appropriate hose either with or without a further valve.

It is a further object of this invention to provide a vacuum handpiece, including an integral valve, which may be skillfully manipulated for the selective application of vacuum and which is comfortable and convenient in use both for the doctor or his assistant and for the patient.

Vacuum devices, such as the saliva ejector or vacuum hose of the prior art, by their inherent nature, produce an offensive noise in their operation. Thus, it is desirable to interrupt the operation of such devices when they are not actually in use. This is difficult to do since it requires either that both hands of the doctor or his assistant be used, where the device is being selectively applied, or that the device be otherwise supported than by the hand of the doctor or his assistant.

It is a further object of this invention to provide a vacuum handpiece, including an integral valve, the operation of which may be easily interrupted and subsequently reestablished with one hand and without substantial change in the grip of the hand on the handpiece.

In the selective application of vacuum to the oral cavity or the like in the performance of dental and surgical procedures, particularly where a large diameter vacuum device is used, it often happens that an object or large particle such as a dental "crown," for example, is unintentionally picked up with the liquids which it is desired to remove. It is, of course, necessary to prevent such objects and large particles from entering the vacuum pump or other source of low pressure, however, it is also often desirable to be able to quickly and easily recover the object or large particle. Furthermore, it is necessary to be able to clean and maintain the device at frequent intervals to insure maximum effectiveness and minimum danger of contamination.

It is yet another object of this invention to provide a vacuum handpiece including integral means for trapping objects and large particles with little interference with the normal flow of liquids therethrough and which may be disassembled easily and quickly for the recovery of such objects and large particles as well as for cleaning and maintenance.

U.S. Pat. No. 3,511,240 teaches a valve and remote control apparatus and discloses a specific application of such valve and remote control apparatus as an evacuator for use by a dentist. According to the teaching of this patent the remote control portion of the apparatus is included in a handpiece and a pair of coaxial hoses are required to connect the handpiece both to a source of low pressure and to the valve portion of the apparatus. Thus, the handpiece disclosed in this patent is complicated, difficult to clean and maintain, expensive to fabricate and lacking in the convenience and ease of use as well as other advantages of the handpiece including the integral valve according to this invention. Specifically, the use of coaxial hoses will detract from the flexibility of the device, no means for quick and easy maintenance or for recovery of objects and large particles is provided and continuous actuation by the hand in use is required.

It is a still further object of this invention to provide a vacuum handpiece, including an integral vacuum valve, which is stable in either its actuated or non-actuated conditions.

Finally, it is an object of this invention to provide a vacuum handpiece which is simple and inexpensive to fabricate as well as to clean and maintain.

SUMMARY OF THE INVENTION

Briefly, a vacuum handpiece according to this invention includes a vacuum valve comprising a valve seat member having a smooth surface of given contour and a passageway therethrough terminating in an aperture in said smooth surface of given cross-sectional area and a valve slide member having a smooth surface adapted to mate with the smooth surface of given contour of the valve seat member with a given tolerance. The valve slide member has a passageway therethrough and the smooth surface of the valve slide member has a first portion with an area at least equal to the cross-sectional area of the aperture in the smooth surface of the valve seat member and a second portion penetrated by an aperture communicating with the passageway through the valve slide member. The valve slide member and valve seat member are attached to each other by means positioning the smooth surfaces thereof in mating relation and allowing slidable movement of such surfaces with respect to each other between a first position in which

the first portion of the smooth surface of the slide member is aligned with the aperture in the smooth surface of the valve seat member and a second position in which at least part of the aperture in the second portion of the smooth surface of the valve slide member is aligned with the aperture in the smooth surface of the valve seat member. An annular resilient means is mounted on the valve seat member surrounding the aperture in the smooth surface of the valve seat member and projecting above such smooth surface a distance substantially equal to the tolerance of the mating relation between the smooth surfaces of the valve slide and valve seat member. Means are provided for moving such smooth surfaces with respect to each other between the first and second positions thereof. The handpiece also includes an elongated body member having a passageway therethrough and adapted to be held in the human hand with one end of the body member adapted for airtight attachment to the free end of the flexible hose of a suction apparatus with the hose in communication with the passageway. The valve seat member is mounted on the other end of the body member with the passageway in the body member communicating with the opposite end of the passageway in the valve seat member from the aperture in the smooth surface of the valve seat member. A tubular member is mounted on the valve slide member in communication with the opposite end of the passageway through the valve slide member from the aperture in the smooth surface thereof and extends such passageway in a direction transverse to the axis of elongation of the body member.

BRIEF DESCRIPTION OF THE DRAWING

The foregoing objects and features of this invention will be more fully understood from a reading of the following description of preferred embodiments in conjunction with the attached drawings wherein

FIG. 1 is a perspective view of a vacuum handpiece according to a preferred embodiment of this invention shown with the valve thereof in its "off" position.

FIG. 2 is an exploded side view in elevation of the vacuum handpiece of FIG. 1.

FIG. 3 is a side cross-sectional view in elevation of a vacuum handpiece according to the preferred embodiment of this invention with the valve thereof shown in its "on" position and with a "surgical" tip of smaller diameter substituted for the normal tip shown in FIG. 1.

FIG. 4 is a fragmentary cross-sectional view identical to FIG. 3 but with the valve shown in its "off" position.

FIG. 5 is a cross-sectional view of the valve seat portion of the handpiece taken along line 5—5 of FIG. 2.

FIG. 6 is a cross-sectional view taken along line 6—6 of FIG. 5.

FIG. 7 is a view of the bottom of the valve slide portion of the handpiece taken along line 7—7 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2 a vacuum handpiece 10 according to a preferred embodiment of this invention is shown. The handpiece includes an elongated body member 12, a valve seat member 14, a valve slide member 16 and means 15 for attaching the valve slide member 16 and the valve seat member 14 to each other.

A tubular tip 17 is mounted on the valve slide member 16 and extends in a direction transverse to the axis

of elongation of the body member 12. The body member 12 according to this embodiment of the invention is provided with a swivel tube 18 adapted to be received in the free end of the flexible hose (not shown) of a suction apparatus providing a source of low air pressure.

As indicated in FIG. 2, an annular resilient member 13, which may be a rubber O-ring, for example, is interposed between the valve seat member 14 and the valve slide member 16 of the handpiece to provide an airtight seal as will be more fully discussed hereinafter. Similarly, a rubber O-ring 19 is interposed between the end of the swivel tube 18 and the body 12 of the handpiece to provide an airtight seal. Finally, a basket 20 is received within the body 12 immediately below the valve seat 14 to filter objects and large particles from the fluids evacuated through the handpiece.

It will be understood that the body 12 of the handpiece 10 is dimensioned to provide a comfortable grip for the human hand in use. It will also be understood that the handpiece is normally held in the manner of a pistol in use, although other orientations may also be convenient for certain purposes as will be discussed hereinbelow. Thus the action of the swivel tube 18 coupled with the flexibility of the hose (not shown) will enable the handpiece to be manipulated easily and skillfully within the oral cavity or other surgical site to be evacuated.

Referring now to FIGS. 3 and 4, the handpiece 10 is shown in side cross-section as fully assembled and with a "surgical" tip 17' of smaller diameter substituted for the normal tip 17 of FIGS. 1 and 2. Except for the surgical tip 17' and the adapter plug 21 required to enable the small diameter surgical tip to be substituted for the larger diameter normal tip 17, the handpiece of FIGS. 3 and 4 is the same as the handpiece 10 of FIGS. 1 and 2 and the same reference numerals are used to denote the same parts. In FIG. 3 the valve seat member 14 and valve slide member 16 are shown in position with respect to each other to provide an open passage through the handpiece from the tip to suction apparatus whereas in FIG. 4 the valve slide member 16 is positioned with respect to the valve seat member 14 to close such passageway.

As best shown in FIGS. 3 and 4, the valve seat member 14 comprises a flat plate having a smooth upper surface 24. An aperture 23 in the smooth upper surface 24 together with a tubular member 26 projecting from the lower surface of the valve seat member 14 provide a passageway therethrough. An externally threaded nipple 25 integral with the valve seat member 14 surrounds the tubular member 26 and is adapted to be received by mating internal threads 22 in the end of the body 12.

Similarly, as best shown in FIG. 7, the valve slide member 16 comprises a smooth flat surface 27 conforming to the smooth surface 24 of the valve seat member 14. The smooth surface 27 of the valve slide member 16 includes a first portion 28 having an area larger than the cross-sectional area of the aperture 23 in the smooth surface 24 of the valve seat member 14 and a second portion 29 penetrated by an aperture 30.

As best shown in FIGS. 3 and 4, the slide member 16 has a passageway 33 formed therethrough which communicates with the aperture 30 at one end thereof with the tip 17 or 17' being mounted airtight in the other end thereof. According to the embodiment of the in-

vention shown in the drawing, the cross-sectional areas of the apertures 23 and 30 as well as of the passageway 33 and tubular member 26 are all substantially the same. However, it will be understood that it is not necessary that such cross-sectional areas be the same. Instead the aperture 30 and passageway 33 could be of smaller cross-sectional area than the aperture 23 and tubular member 26, for example.

As shown in FIGS. 3 and 4, the annular resilient member 13, which may be a rubber O-ring for example, is received in an annular groove formed in the smooth surface 24 of the valve seat member 14 about the aperture 23 therein. The depth of the groove and the dimensions of the resilient member 13 are selected so that the resilient member 13 projects from but is firmly held in place in the groove when the slide member 16 is moved with respect to the seat member 14.

The effect of the annular resilient member 13 is to insure an airtight seal between the valve seat member 14 and valve slide member 16 even though the tolerance of the mating relationship between the smooth surfaces 24 and 27 thereof is loose by design or becomes loose due to wear. It will be understood that, particularly when the slide member 16 is in the position shown in FIG. 4 with respect to seat member 14, the low pressure present in the body 12 and tubular member 26 will pull the first portion 28 of the smooth surface of the slide member into compressive contact with the annular resilient member 13 insuring an airtight seal.

Although the smooth surfaces 24 and 27 on the valve seat member 14 and valve slide member 16 respectively are flat according to the embodiment of the invention shown in the drawing, it will be understood that such surfaces could be smoothly curved. For example, in other embodiments, such surfaces 24 and 27 could be mating spherical surfaces of large diameter and rotated with respect to each other to produce the required relative movement, or they could be cylindrically curved about an axis extending in the direction of rectilinear relative movement therebetween or about an axis of rotary movement therebetween.

However, the embodiment shown is preferred for ease of manufacture and mounting of valve seat member 14 and valve slide member 16 with respect to each other. Thus, as best shown in FIGS. 1, 5, 6 and 7, the means 15 for mounting the valve slide member 16 on the valve seat member 14 may comprise a pair of upstanding walls along opposite edges of the smooth surface 24 of the valve seat member 16. According to the embodiment of the invention shown, the facing surfaces of the walls 15 are provided with grooves 35 to receive runners 36 protruding from the sides of the slide member 16. The grooves 35 and runners 36 extend substantially parallel to the smooth surfaces 24 and 27; however, as pointed out above, the dimensional and directional tolerances thereof may be quite broad due to the inclusion of the annular resilient member 13. Thus, the movement of the valve slide member 16 with respect to the valve seat member 14 is generally guided by the interaction of the runners 36 with the grooves 35, but the airtight seal may be insured by the low pressure and the resilient member 13 due to the loose tolerance of the mating relationship between the various parts.

It is, of course, desirable to provide a stop means at each end of the travel of the valve slide member 16

with respect to the valve seat member 14. Again, considerable tolerance may be allowed in such stop means since exact alignment of the slide 16 and seat 14 members is not necessary.

According to this embodiment of the invention, a trigger-like protuberance 40 extending from the valve slide member 16 along the axis of elongation of the body 12 of the handpiece serves both as a convenient means for actuating the valve and as a stop means for limiting the travel of the slide member 16 in the actuating direction. Thus, as best shown in FIG. 3, the slide member 16 is moved to the "on" position by tightening the index finger of the hand on the trigger-like protuberance 40 in the manner of a pistol. The location of the aperture 30 in the smooth surface 27 of the slide member 16 with respect to the location of the aperture 23 in the smooth surface of the seat member 14 is such that the two apertures will be generally aligned in this position of the slide member 16 and a continuous passageway will be provided through the handpiece.

In order to provide a stop means at the opposite end of the travel of the slide means 16 to the "off" position shown in FIG. 4, a further groove 45 may be formed in the inner face of each of the walls 15 for cooperation with a button-like protuberance 46 on opposite sides of the slide member 16. As best shown in FIG. 6, the grooves 45 extend only part way across the inner face of the walls 15 along the direction of movement of the slide member 16 with respect to the seat member 14. Thus, the slide member 16 may be conveniently moved by the thumb of the hand of the user from the position shown in FIG. 3 to the position shown in FIG. 4, with the travel to the position shown in FIG. 4 limited by the abutment of the button-like protuberances 46 against the end of the grooves 45.

However, as best shown in FIGS. 2 and 7, the button-like protuberances 46 are smoothly rounded. Thus, they may be forced beyond their abutment with the end of the grooves 45 to thereby completely remove the slide member 16 from engagement with the seat member 14 including the wall means 15. This will allow free access to the smooth surfaces 24 and 27 and to the resilient member 13 as well as to the apertures 23 and 30 for cleaning and maintenance of the handpiece.

Referring to FIGS. 3 and 4, it will be seen that an annular partition 50 is provided in the passageway through the body 12 intermediate the ends thereof. The partition 50 is preferably shaped like a funnel with its restricted end extending into the swivel tube 18. Thus, the partition 50 is spaced from the bottom of the basket 20, which is captured within the body 12 between an integral flange 49 on the body 12 and the threaded member 25 on the valve seat member 14. The partition 50 serves as a seat for the O-ring 19 which is compressed thereagainst by the end of the swivel tube 18.

The end of the swivel tube 18 is held in compressive engagement with the O-ring 19 by means of a ring 51 and groove 52 arrangement toward the lower end of the body 12 as shown in FIGS. 2 and 3. Thus, according to this embodiment of the invention, the swivel tube 18 is provided with a protruding ring 51 (see FIG. 2) and the body 12 is provided with an annular groove 52. The spacing of the ring 51 and groove 52 from the end of the swivel tube 18 and the partition 50, respectively, is selected to provide the compressive contact between the end of the swivel tube 18 and the O-ring 19 required to insure an airtight seal when the handpiece is

off and yet allow the desired swivel action when the handpiece is on and in use.

It will be seen from FIGS. 3 and 4 that the sides of the basket 20 are spaced from the inner wall of the passageway through the body 12 of the handpiece 10, and that the sides of the basket 20 are apertured to allow free passage of fluids while obstructing the passage of objects and large particles. Thus, the basket 20 will tend to insure continued passage of fluids even though it may be substantially filled by an object, such as a dental "crown" for example, or by a collection of large particles. Access to the basket 20 to recover objects or remove particles may be readily obtained by simply unscrewing the threaded engagement between the member 25 of the valve seat 14 and the end of the body 12. Even though the handpiece 10 is not disconnected from the source of low pressure, it will usually be possible to recover heavy objects from the basket although it may be desirable to turn off the source of low pressure or disconnect the handpiece 10 from the source of low pressure, as by means of an auxilliary valve, in order to remove a collection of large particles from the basket 20.

From the above description and the drawing, it will be seen that a vacuum handpiece 10 according to the teaching of this invention is mechanically simple and easy to fabricate. Thus, the body 12, the valve seat 14 including walls 15 and members 25 and 26, the slide member 16, the tip 17, the basket 20 and the swivel member 18 may each be molded separately out of a suitable plastic, for example, and subsequently assembled with rubber O-rings 13 and 19 to form the required airtight sliding seals between the parts. Similarly, the handpiece may be easily disassembled for cleaning and maintenance. The location of the rubber O-rings is such that the low pressure present in the handpiece will insure airtight seals at such locations even though the parts are made to a relatively loose tolerance and subsequently subjected to wear in use.

The fact that the valve members 14 and 16 are stable in either the on or off position thereof reduces fatigue in use of the handpiece. In addition, this fact allows the handpiece to be held in other than pistol-grip fashion for use. Thus, the handpiece may be skillfully and flexibly manipulated in use and even passed from one person to another without interrupting its operation.

It is believed that those skilled in the art will find many uses for the vacuum handpiece and vacuum valve disclosed hereinabove and that they will make obvious modifications in the specific embodiment of this invention to suit the particular use, some of which have been suggested hereinabove. For example, the shape and size of the tip may obviously be changed to suit the use of the handpiece as suggested herein. The material used to make the handpiece is a matter of choice depending on the use and the manufacturing cost involved. Finally, the valve may be made in other forms, some of which are suggested hereinabove and others of which will be obvious, such as forming the mounting walls 15 integrally with the slide member 16 rather than with the seat member 14. Obviously, the handpiece can be used for other than dental or surgical purposes, where it is desired to evacuate fluids, objects or small particles from a given area, and the valve could be used in any apparatus specifically designed for such other uses.

What is claimed is:

1. A vacuum valve comprising:

- a. a valve seat member having a smooth surface of given contour and a passageway therethrough terminating in an aperture of given cross-sectional area in said smooth surface;
- b. a valve slide member having a passageway therethrough and a smooth surface adapted to mate with said smooth surface of said given contour of said valve seat member with a given tolerance, said smooth surface of said valve slide member having a first portion with an area larger than said given cross-sectional area of said aperture in said smooth surface of said valve seat member and a second portion penetrated by an aperture communicating with said passageway through said valve slide member;
- c. means attaching said valve slide member and said valve seat member to each other with said smooth surfaces thereof in mating relation for slidable movement with respect to each other between a first position in which said first portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member and a second position in which at least a part of said aperture in said second portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member;
- d. annular resilient means surrounding said aperture in said smooth surface of said valve seat member, said annular resilient means being mounted on said valve seat member and projecting from said smooth surface of said valve seat member a distance substantially equal to said given tolerance of said mating relation between said smooth surfaces of said valve seat member and said valve slide member; and
- e. means for moving said smooth surfaces of said valve slide member and said valve seat member with respect to each other between said first and second positions thereof.

2. A vacuum valve as claimed in claim 1 wherein said mating smooth surfaces of said valve seat member and said valve slide member are flat planar surfaces.

3. A vacuum valve as claimed in claim 1 wherein said apertures in said smooth surfaces of said valve seat member and said valve slide member have substantially the same cross-sectional area and said annular resilient means is a rubber O-ring.

4. A vacuum valve as claimed in claim 1 wherein stop means are provided for limiting the slidable movement of said valve seat member and said valve slide member with respect to each other to movement between said first and second positions thereof.

5. A vacuum handpiece for use with suction apparatus including a flexible hose, said handpiece comprising:

- a. an elongated body member adapted to be held in the human hand, said body member having a passageway therethrough, one end of said body member including means for airtight attachment to the free end of said flexible hose of said suction apparatus with said hose in communication with one end of said passageway;
- b. a valve seat member having a smooth surface of given contour and a passageway therethrough terminating in an aperture of given cross-sectional

area in said smooth surface, said valve seat member being mounted in airtight relation on said body member with said passageway through said body member in communication with the opposite end of said passageway through said valve seat member from said aperture in said smooth surface of said valve seat member;

c. a valve slide member having a passageway there-through and a smooth surface adapted to mate with said smooth surface of given contour of said valve seat member with a given tolerance, said smooth surface of said valve slide member having a first portion with an area larger than said given cross-sectional area of said aperture in said smooth surface of said valve seat member and a second portion penetrated by an aperture communicating with said passageway through said valve slide member;

d. means attaching said valve slide member and said valve seat member to each other with said smooth surface thereof in mating relation for slidable movement with respect to each other between a first position in which said first portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member and a second position in which at least a part of said aperture in said second portion of said smooth surface of said valve slide member is aligned with said aperture in said smooth surface of said valve seat member;

e. annular resilient means surrounding said aperture in said smooth surface of said valve seat member, said annular resilient means being mounted on said valve seat member and projecting from said smooth surface of said valve seat member a distance substantially equal to said given tolerance of said mating relation between said smooth surfaces of said valve seat member and said valve slide member;

f. means for moving said smooth surfaces of said valve slide member and said valve seat member with respect to each other between said first and said second positions thereof, and

g. tubular means mounted on said valve slide member in communication with said passageway there-through and extending said passageway in a direc-

tion transverse to the axis of elongation of said body member.

6. A vacuum handpiece as claimed in claim 5 wherein said smooth surfaces of said valve seat member and said valve slide member are flat planar surfaces extending transversely of the axis of elongation of said body member.

7. A vacuum handpiece as claimed in claim 5 wherein the direction of said slidable movement of said smooth surfaces of said valve seat member and said valve slide member with respect to each other is transverse of the axis of elongation of said body member.

8. A vacuum handpiece as claimed in claim 6 wherein said means attaching said valve slide member and said valve seat member to each other comprises a pair of upstanding walls extending along opposite edges of said smooth surface of said valve seat member, said upstanding walls having grooves in their facing surfaces which grooves lie in a common plane parallel to the plane of said smooth surface of said valve seat member, said valve slide member having projections on opposite sides thereof adapted to mate with said grooves in said facing surfaces of said upstanding walls when said smooth surface of said valve slide member is in mating relationship with said smooth surface of said valve seat member, and said valve slide member includes a trigger-like protuberance extending from one end thereof along the axis of elongation of said body member, the other end of said valve slide member projecting beyond said valve seat member when said smooth surfaces of said valve slide member and said valve seat member are in said second position with respect to each other.

9. A vacuum handpiece as claimed in claim 5 wherein an apertured basket is mounted within said passageway through said body member and said valve seat member is removably on said body member to provide access to said basket.

10. A vacuum handpiece as claimed in claim 8 wherein said means for airtight attachment of said body member to the free end of said flexible hose includes a swivel tube mounted coaxially within one end of said body member for rotation about the axis thereof; said body member, said valve seat member, said valve slide member and said swivel tube each being independently cast of plastic material and subsequently assembled.

* * * * *

50

55

60

65