Individual elongated containers, preferably square or rectangular in cross section are provided for holding tools and materials necessary for a dental procedure. The containers all have structure on two or more sides thereof to allow them to be assembled together into a single structure so that the practitioner can assemble his own procedure kit. This allows the user to assemble a series of containers holding different sized devices or different devices in a small assembled structure for easy access, to vary the components of the structure as required for each procedure and to remove an empty container or a container with the incorrect contents from the assembly and replace it with a proper device or material. The containers are particularly configured to hold thin, elongated devices, such as a series of containers for different size endodontic files, gutta percha, swabs, absorbent paper points, posts, or other dental tools or materials.
ATTACHABLE PACKAGES FOR THIN, ELONGATED DEVICES

[0001] The present application relates to packaging for elongated devices, such as medical devices, each package containing different devices or different sizes of the same devices. The individual packages are suitable for assembly by the user into a procedure kit. In particular the application is directed to elongated devices for use in dental procedures and, in a particular embodiment, instruments and materials used in endodontic procedures.

BACKGROUND

[0002] In numerous medical procedures and particularly dental procedures the physician dentist or dental technician will use several different tools and various different sizes of particular tools. In a dental root canal procedure the crown of a diseased tooth is opened in order to allow access to the canal in the tooth to be cleaned and then filled. The dental practitioner removes the pulp material forming the nerve of the tooth at issue, carefully prepares the canal that contained the nerve material, and other pulp tissues and obturates or fills and seals the canal. After the crown is opened, a series of very elongated flexible instruments, commonly called files, are used to clean out and shape the root canal. Each file is rotated either manually or by a powered dental handpiece and reciprocated in the canal by the clinician. Files of increasingly larger diameters or varying contours or tapers are used in sequence, to achieve the desired cleaning and shaping. After the canal is prepared and the tissue and nerves are removed, it is solidly filled with a filling material, which typically comprises a waxy, rubbery compound known as gutta percha. The gutta percha can be manually introduced into the canal or an instrument, referred to as a compactor, can be inserted into the prepared canal and rotated and reciprocated to compact the gutta percha therein. The portion of the canal above the gutta percha is then filled with a protective cement. A crown may be placed over the tooth. A dental post may be placed into the newly prepared root canal to provide support for the coronal aspect of the tooth.

[0003] In performing the root canal procedure there is an ongoing need for kits which would allow the practitioner to assemble, prior to performing the procedure, all of the tools or materials required or which might be required. These tools and materials are typically provided in bulk or single use packaging and end up being scattered on surrounding tables, trays and cabinet surfaces.

[0004] As an example, endodontic files used to clean and shape the canal are commonly supplied to the clinician in kits which comprise several files of increasing diameter generally ranging from 0.08 mm at the tip (size 08) to 1.40 mm at the tip (size 140). The kits typically contain a number of files of increasing diameter so that the files from a particular kit may be used in sequence by the clinician in accordance with the requirements of the particular canal being cleaned. Also, in the conventional kits, the working length of each file in the kit is tapered, at an included angle of between about ½ and 4 degrees, the tapers of all of the files in the kit being the same.

[0005] The endodontic procedure includes the steps of inserting a selected one of the instruments in the above described kit into the root canal and rotating and reciprocating the instrument so as to extirpate the canal and form the canal into a general conical configuration including a relatively wide crown portion and an apex at the inner end of the root canal, and withdrawing the selected first one of the instruments from the canal and inserting a selected second one of the instruments in the canal, with the selected second one of the instruments having a larger diameter and a taper which differs from that of the selected first one of the instruments, and rotating and reciprocating the selected second one of the instruments so as to extirpate the canal and further form the canal into a general conical configuration. The second file is then is withdrawn from the canal and a third file having a larger diameter and a taper which differs from that of the selected second file is inserted in the canal and rotated and reciprocated in order to extirpate the canal and further form the canal into a general conical configuration.

[0006] Many devices, particularly elongated products are packed in containers holding several of the products, for example U.S. Pat. No. 3,372,802, U.S. Pat. No. 3,648,891, U.S. Pat. No. 3,815,734, U.S. Pat. No. 4,266,667 and U.S. Pat. No. 6,902,064. Devices used in dental procedures may be packaged in a bulk package (i.e. 1 dozen, 20 units, etc) such that the practitioner must removed the desired product from the package and assemble the tools and materials needed for a procedure. U.S. Pat. No. 5,429,243 to Woelfel et al. shows a packaging box for receiving a plurality of elongated objects such as small bottles or ampoules. U.S. Pat. No. 3,759,375 to Nappi shows a shipping package containing multiple disposable swabs, each swab in a trough in a separable section. Other patents show various different trays for receiving tools for use in dental procedures such as U.S. Design Pat. 288,846 and U.S. Pat. No. 4,333,567 to Leonard. U.S. Pat. No. 4,353,694 shows a tray with multiple compartments of different sizes and shapes for receiving the various instruments and materials used in a procedure. A further alternative is a single package which includes several products (a starter drill, a finishing drill and multiple dental posts) for use in placing posts following a root canal procedure (U.S. Pat. No. 7,195,485). U.S. Pat. No. 5,653,590 is directed to a kit of endodontic instruments, namely different diameter and different taper files for use in a root canal procedure but does not discuss how these tools are packaged.

[0007] There are also patents disclosing multiple containers provided with structure or shape so that they can be nested together. For example, U.S. Pat. No. 6,857,530 shows bottles having nesting shapes which are then held together by an external wrapper. U.S. Pat. No. 4,165,812 shows four containers which when assembled form a structure with a circular periphery, each bottle comprising one-quarter of the cylindrical structure. Each one of the bottles has two flat sides, one flat side having a protrusion and the other flat side having a mating indentation. When assembled the protrusion on one bottle rests in the indentation on the adjacent bottle for forming the integral cylindrical arrangement. U.S. Pat. Nos. 5,007,540 and 5,115,916 to Beasley show four containers each having a triangular cross section. Two of the three sides of each container have the mating halves of a hook and loop attachment system secured thereto such that when nested together around a central core structure the four containers form a square structure with four separate compartments.

SUMMARY

[0008] In accordance with the invention herein disclosed all of the tools and materials necessary for the dental procedure are provided in individual elongated containers, preferably square or rectangular in cross section. The containers are
configured to hold thin, elongated devices, such as a series of containers for different size endodontic files, gutta percha, swabs, absorbent paper points, posts, etc. Additional attachable individual containers may be provided to hold various liquids, powdered materials or paste used in the procedure along with tools to apply those materials.

[0009] The containers all have structure on two or more sides thereof to allow them to all be assembled together into a single structure so that the practitioner can assemble his own procedure kit. This allows the user to assemble a series of different sized devices or different devices (files, gutta percha, absorbent points, etc.) in a small assembled structure for easy access, to vary the components of the structure as required for each procedure and to remove an empty container or a container with the incorrect contents from the assembly and replace it with a proper device or material.

BRIEF DESCRIPTION OF DRAWINGS

[0010] FIG. 1 is a front perspective view of a first embodiment of a container incorporating features of the invention.

[0011] FIG. 2 is a cross sectional view along line 2-2 of FIG. 1.

[0012] FIG. 3 is an assembly of four containers such as shown in FIG. 1 arranged in a linear array.

[0013] FIG. 4 is a cross sectional view of a second embodiment incorporating features of the invention.

[0014] FIG. 5 is an assembly of five containers such as shown in FIG. 1 arranged in other than a linear array and including two different size containers.

[0015] FIG. 6 is an assembly of seven containers such as shown in FIG. 1 arranged in other than a linear array and including two different shape containers.

[0016] FIG. 7 is a front perspective view of a second embodiment of a container incorporating features of the invention, the container having square connecting extensions.

[0017] FIG. 8 is a front perspective view of a third embodiment showing a short container incorporating features of the invention.

[0018] FIG. 9 is an assembly of two containers such as shown in FIG. 7 and two containers such as shown in FIG. 8 arranged in a linear array.

DETAILED DESCRIPTION

[0019] In a dental procedure, such as an endodontic procedure, the clinician will use many different tools, different sized tool and materials to prepare the tooth, access the root, clean out the root canal, treat the cleared canal to prevent infection and fill and close the treated canal. The various tools, which may be disposable or reusable, and materials may be provided in various different bulk packaging or sterile individual packaging. These packaged tools and materials may be placed on a stand adjacent the procedure area or a procedure tray may be used to receive the various different tools and materials for a procedure. However, a more preferred approach is for each of the various tools, or a set of various sized tools, and the materials to be initially provided in their own single procedure container and the containers be configured so that they can be assembled into a procedure tray by the dentist or support staff prior to each procedure. The individual tools, sets of tools and/or materials can be provided by the manufacturer in containers as described herein so that they can be assembled by the dentist, or the clinician may have multiple empty containers such as described herein so that they can be filled and a procedure tray can be assembled. Alternatively, some of the tools or materials may be provided by the manufacturer in individual containers as set forth herein while theclinician may have compatible empty containers for receiving additional tools or materials. In any event, a procedure tray comprising multiple separate containers can be assembled with the compartments thereof (i.e., the container contents) placed in an order or orientation to the other tools and materials most convenient to the dentist.

[0020] FIGS. 1 and 2 show a first embodiment of a container 10 incorporating features of the invention. While the container can be of various different sizes, dimensions, and cross sectional area, FIG. 1 illustrates an elongated container 10 with a square cross section. The container 10 has a closed bottom 12, four elongated rectangular sides 14 and, in FIG. 1, an open top 16. However, a cap or cover, not shown, can be provided for the open top 16. In the embodiment of FIG. 1 each of the sides 14 includes means for attaching multiple containers 10 together. In the embodiment shown tabs 18 extends from two opposite sides. The remaining two sides have similar sized indentations 20. To connect two containers 10 a tab 18 on one of the containers 10 is inserted into an indentation 20 on the second container. The tabs 18 and indentations 20 are sized so as to provide a friction or snap fit to hold containers 10 together until pulled apart.

[0021] FIG. 3 shows four containers 10 attached in a linear arrangement. One skilled in the art will recognize that additional containers can be added to the end of the linear arrangement to extend the length or containers can be added to either side to extend the width. FIGS. 5 and 6 show additional arrangements of the attachable containers 10 as well as different size or shaped containers. FIG. 5 shows five containers including a central square container 22 with bigger sides and FIG. 6 shows six containers 10 arranged around a centrally located rectangular container 24.

[0022] The invention contemplates using containers of various different cross sections not limited to four-sided containers as well as solid containers with shallower internal areas for placement of liquids or paste-like materials. FIG. 4 shows a further embodiment of a square cross section with only one tab 18 and one indentation 20 on opposite sides which limits the assembly to a linear arrangement. As an alternative the one tab 18 and one indentation 20 could be on adjacent sides which would allow the assembly of four containers into a square arrangement.

[0023] While FIGS. 1-6 all show the use of elongated tabs 18 and similarly sized indentations 20, various other shaped interacting tabs and indentations can be used, such as circles, ovals, stars, squares arcs, etc., with one or more on a side, or other attachment means can be used such as hook and loop fasteners, commonly referred to as Velcro®, fasteners or adhesive strips. FIGS. 7 and 8 show a further embodiment of the elongated container 30 and a short container 40, each having square tabs 42 and compatible shaped indentations 44. Still further, instead of indentations, cooperating extensions can be formed on the sides of the containers to be joined.

[0024] If different sized containers are used, in order to make them compatible for assembly it is preferred that they all have a width based on a smallest standard size, the larger sizes having widths that are multiples of the smallest container width. For example, referring to FIG. 1 as representing the smallest size container, if each side has a width of 1 inch, then other containers have side widths which are multiples thereof (1", 2", 3" etc.). Further, the tabs 18 and indentations 20 preferably alternate around the circumference of the container and are centrally spaced in each 1" interval such as is demonstrated by the rectangular container 24. This allows for
the most compact assembly of multiple containers. Similarly
the smallest container could be 1.5" and the larger sized units
would have side widths of 3", 4.5", etc. with the connector
centrally located and every 1.5" apart.

[0025] In preferred embodiments the containers 10, 30 are
elongated hollow rectangular structures. However, the invent-
ion contemplates that the use of shorter containers 40 which
have a hollowed internal area shallow in depth to make the
contents, such as liquids or gels, more accessible to the users.
It is also contemplated that shallow containers and elongated
containers could be combined in an assembled structure such
as shown in FIG. 9 which is a front view of two elongated
containers 30 and two shallow containers 40 in a linear
arrangement. Of course, additional containers of any desired
length can be added to the width or depth of the assembly of
FIG. 9. For ease of use a stand or foot (not shown) can be
provided for removable attachment to the lower end of the
container 10, 30, the base preventing the container or assem-
bly of multiple containers from falling over.

I claim:
1. Connectable containers for devices or materials each
container comprising:
a hollow receptacle having a closed bottom, at least four
side walls and an open top for receiving the devices or
materials, at least one of said side walls having thereon
or therein a first half of a connector and another of said
side walls having thereon or therein a second half of a
connector,
said first half of the connector and said second half of the
connector located and configured to receive a compat-
ible second half of a connector or a first half of a con-
ector, respectively on at least a second receptacle said
first half of the connector and said second half of the
connector functioning to join two or more receptacles
together.
2. The connectable containers of claim 1 wherein said first
half of the connectors and said second half of the connectors
are molded into or onto the side walls or are attached to the
side walls.
3. The connectable containers of claim 1 wherein said first
half of the connectors comprises an extension from at least
one side wall and said second half of the connectors
comprises a compatible indent in at least a second side wall.

4. The connectable containers of claim 1 wherein said first
half of the connectors comprises a fastener attached to at least
one side wall and said second half of the connectors
comprises a compatible fastener attached to at least a second side
wall.
5. The connectable containers of claim 1 wherein all of the
side walls have connectors thereon or therein and, where the
container has an even number of side walls, half of the side
walls have the first half of the connectors therein or thereon
and the remainder of the side walls have the second half of the
connectors therein or thereon, the first half of the connectors
and the second half of the connectors alternating around the periphery of the receptacle.
6. The connectable containers of claim 1 wherein all of the
containers have the same length.
7. The connectable containers of claim 1 wherein the con-
tainers are of two or more different lengths.
8. The connectable containers of claim 1 each container
having one first half connector and one second half connector
the first half connector and second half connector not being on
adjacent sidewalls.

9. The connectable containers of claim 1 wherein the first
and second halves of the connectors are compatible exten-
sions and indents, or compatible hook and loop fasteners, or
adhesive fasteners.
10. An assembly of two or more containers for devices or
materials, said containers arrangeable and connectable by a
user in a random manner comprising multiple hollow recep-
tacles
each hollow receptacle having a closed bottom, at least four
side walls and an open top for receiving the devices or
materials, at least one side wall having thereon or therein
a first half of a connector and another of said side walls
having thereon or therein a second half of a connector,
said first half of the connector and said second half of a
connector located and configured to receive a compat-
ible second half of a connector or a first half of a con-
nectors respectively on at least a second receptacle said
first half of the connector and said second half of the
connector functioning to join said two or more receptacles
together.
11. The assembly of two or more containers of claim 10
wherein said first half of the connectors and said second half
of the connectors are molded into or onto the side wall or are
attached to the side walls.
12. The assembly of two or more containers of claim 10
wherein said first half of the connectors comprises an exten-
sion from at least one side wall and said second half of the
connectors comprises a compatible indent in at least a second side wall.
13. The assembly of two or more containers of claim 10
wherein said first half of the connectors comprises a fastener
attached to at least one side wall and said second half of the
connectors comprises a compatible fastener attached to at least
a second side wall.
14. The assembly of two or more containers of claim 10
wherein all of the side walls have connectors thereon or therein and, where each container has an even number of side
walls, half of the side walls have the first half of the connectors thereon or therein and the remainder of the side walls
have the second half of the connectors thereon or therein, the
first half of the connectors and the second half of the connectors
alternating around the periphery of the receptacle.
15. The assembly of two or more containers of claim 10
comprising four or more containers connected together.
16. An endodontic procedures kit comprising two or more
containers for devices or materials, said containers arrange-
able and connectable by a user in a random manner compris-
ing multiple hollow receptacles
each individual containers having therein a specific content
selected from endodontic files of different taper or diam-
eter, gutta percha, swabs, absorbent paper points, and
posts, and other containers having contents selected by the
user.
17. A package for endodontic files comprising hollow
receptacle having a closed bottom, at least four side walls and
an open top for receiving the devices or materials, at least one
side wall having thereon or therein a first half of a connector
and another of said side walls having thereon or therein a
second half of a connector,
said first half of the connector and said second half of a
connector located and configured to receive a compat-
ible second half of a connector or a first half of a con-
nectors respectively on at least a second receptacle said
first half of the connector and said second half of the
connector functioning to join said two or more receptacles
together.

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