

**DRAFTING OF PATENT SPECIFICATIONS: 2007**

**PAPER 1**

Date: 23 July 2007

Time: 09h00 – 13h00 (candidates requiring extra time are entitled to an additional two hours)

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Note: This paper consists of two questions. Both questions need to be answered.

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**QUESTION 1**

**TOOTHBRUSH WITH PRESSURE ALARM**

A. Letter from client

You receive the following letter from your client:

Dear Sirs

I have invented a toothbrush with an alarm to warn a user when too much pressure is applied when brushing teeth.

Figure 1 shows a cross-sectional side view of the toothbrush.

The toothbrush 1 has an elongate brush head 2 extending out of a hollow elongate handle 3. The brush head has bristles 7 on its side, at a free outer end thereof.

The elongate brush head extends out of an open end 21 of the hollow handle 3.

The brush head 2 is pivotably connected at a pivot point 9 inside the handle 3. The pivot

point 9 is approximately one third of the length of the brush head from an inner end 10 of the brush head 2. The inner end 10 of the brush head is thus located inside the handle operatively below the pivot point 9 so that the brush head forms a type of over-centre lever.

A coil spring 11 is transversely positioned between an inner surface of a wall of the handle 3 and the side of the brush head 2.

The coil spring 11 abuts the brush head below the pivot point 9 and above the inner end 10 of the brush head 2. An axis of the coil spring 11 is transverse to the axis of the brush head 2 and handle 3. The coil spring 11 forces the brush head towards a first or rest position in which the coil spring 11 is not under any significant tension and fits snugly between the inner surface of the handle wall and the side of the brush head 2.

An operative lower end of the handle 3 terminates in a screw threaded co-axial bore 19 with a complementary screw threaded plug 18, removably engagable in the bore 19.

A second coil spring 17 is co-axially located between the plug 18 and one end of a battery cell 6b to ensure proper contact of the battery cell 6b with an end contact of a second battery cell 6a and the proper contact of both batteries (6a and 6b) with electrical contacts of an electrical circuit.

The electrical circuit is located inside the hollow handle 3. The electrical circuit consists of contact points and electrical conductor wires or stiff elongate connectors, the two battery cells (6a and 6b), a loudspeaker 5 and a light 4, all connected in series.

The loudspeaker 5 is located inside the handle 3 at a lower end of the handle.

The light 4 is located in a side wall of the handle 3 so that it is visible from the outside of the handle. The light is also located close to a top of the handle 3 so that it would not be covered by a user's hand when the user holds the toothbrush.

An electrical contact 12 is attached to a side of the inner end 10 of the brush head 2. The bristles 7 and the contact 12 are located on the same side, but at opposite ends, of

the brush head 2. The coil spring also abuts the brush head on this same side of the brush head.

A second electrical contact 13 on an end of an elongate electrical connector 14 is spaced from contact 12 when the brush head is in its first position, and will make contact with the contact 12 when the brush head is in an activation position.

The other end of the elongate contactor 14 terminates at a lower end of the handle 3 where it is connected to one of the contact points (not shown) on the speaker 5.

The other contact point of the speaker 5 is connected to the lower contact of battery cell 6b which is connected in series with battery cell 6a. An electrical wire 15 connects the other upper end of cell 6a to one of two contact points on the light 4. A second contact point of the light 4 is connected to the contact 12 on the brush head 2 with a conductor wire 16.

In use, when enough transverse force is applied to the brush head from the bristle-side thereof, the brush head pushes against the coil spring 11 until the contacts 12 and 13 touch to close the electrical circuit.

When the electrical circuit is closed, the loudspeaker sounds and the light is switched on. A user thus hears the loudspeaker and may also see that the light is switched on, thus warning him or her that too much pressure is applied whilst brushing teeth.

It will be appreciated by those skilled in the art that the spring stiffness coefficient will determine the amount of force to be applied before the circuit is closed.

It is envisaged that the toothbrush described herein will prevent damage to teeth and/or gums by warning a user when too much force is applied.

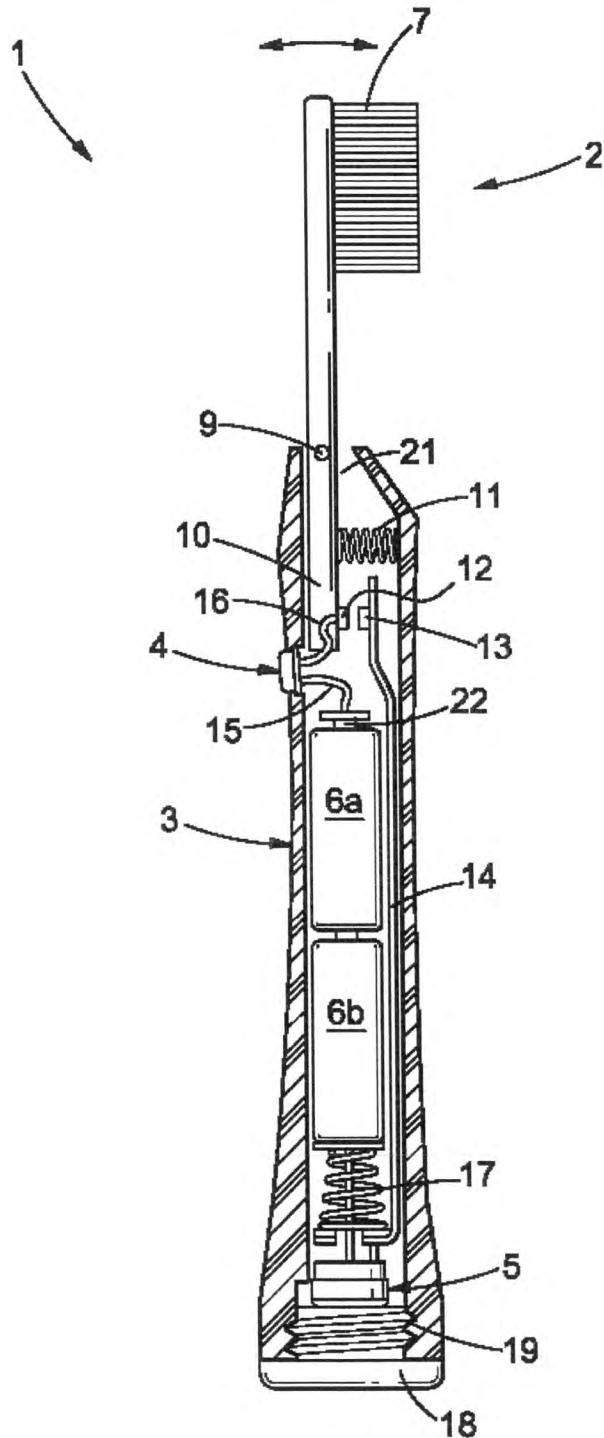
Similar prior-art toothbrushes that I am aware of are toothbrushes having resiliently flexible necks. The necks of these toothbrushes bend backwards under pressure. These toothbrushes, however, do not warn a user when too much pressure is applied by the user, other than a user maybe sensing that the neck of the toothbrush is bent far

back.

Pivotable toothbrush heads are also known. Years ago, toothbrushes were sold with one handle and a number of brush heads. These brush heads were pivotable in exactly the same way as the brush head of Figure 1, when connected to their handle. These toothbrushes did however not have speakers or lights.

B. Question

Identify the inventive feature(s) of the invention and draft a claim to protect the invention.



**FIGURE 1**

**QUESTION 2**  
**DRAUGHTSMAN CASE**

A. Letter from client

You receive the following letter from your client:

Dear Sirs

I have invented a draughtsman case.

Figure 1 shows a perspective view of the draughtsman case with a lid of the case in a closed position;

Figure 2 shows the same view of the case of Figure 1 but with the lid in an operative position;

Figure 3 shows a rear view of hook formations engaged with lugs used to secure the lid to the case body, when the lid is in its closed position or in its operative position;

Figure 4 shows the same view as Figure 3 but with the hook formations pivoted away from the lugs so that the lid may be removed; and

Figure 5 shows a plan view of part of the lid and a hook and lug formation, with the hook formation pivoted away from the lug.

As civil engineers, we sometimes travel to remote areas where no electricity is available. We have to make technical drawings at these remote places and it has happened that the batteries of our portable computers run flat, before we have finished our work. The draughtsman case provides a solution to this problem.

The draughtsman case 1 has a case body 2 and a lid 4.

The lid 4 is secured to the case body 2 with hook and lug formations 7.

The case body is box-like with a square lid and two substantially triangularly-shaped side walls. Each side wall has a rear edge opposite and parallel to and longer than a front edge thereof.

A lower edge of each side wall forms a right angle with each of the front and rear edges. An upper edge of each side wall is thus inclined from the longer rear edge to the shorter front edge.

The height of a front wall of the case is the same as the length of the short edge of the side walls. The height of a rear wall is equal to the length of the longer edge of each side wall.

With the walls secured together and attached on a bottom wall and the lid secured to the walls, the lid 4 thus forms a conveniently inclined surface on which to work.

An underside of the lid defines a drawing board having a grid printed thereon.

A slot 5 at one side of the drawing board runs parallel to the side walls when the lid is secured in an operative position on the upright walls of the case. An operatively downwardly extending projection on a slider 6 fits snugly in the slot so that the slider may be moved up and down the drawing board.

Other drawing instruments 8 may in turn be engaged or are engagable with the slider, as is known in the art.

The lid is securable to the case in a closed position as shown in Figure 1. The lid is secured in this position using the hook and clip formations 7. Two hooks are pivotably attached to the front wall of the case and two hooks are pivotably attached to the rear wall of the case.

Each hook has an elongate base section that terminates in an elbow to form the hook.

An end of each base section is pivotably attached to the walls as described above. Lugs are attached to the lid. Two lugs are attached to an operative front edge of the lid and two lugs are located on a rear edge of the lid, so that the lugs correspond and are engagable, by the elbow sections of the hook formations, by pivoting the elbows of the hook formations towards the lugs.

The lugs consist of short stubs extending substantially normally away from the edges of the lid. The stubs terminate in disc formations, co-axial with each stub.

The elbow sections of the hooks engage frictionally over the stubs and operatively behind the discs to secure the lid to upper edges of the front, rear and side walls (the upright walls) of the case.

The lid may be disengaged from its closed position and re-engaged so that its underside now faces outwardly and upwardly from the case thus providing an inclined drawing board.

We believe that the case described above will provide a convenient solution to our problem.

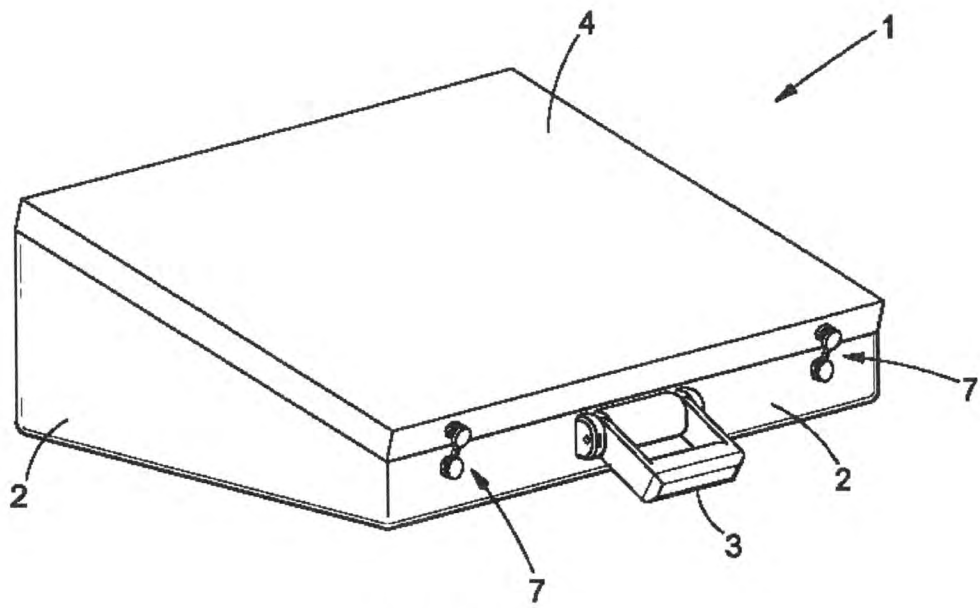
Prior art drawing boards that I am aware of include drawing boards that are stored and carried in briefcases. These briefcases are sold as drawing sets with a loose drawing board and drawing instruments inside the briefcase. The lids of these briefcases do not form drawing boards.

Other prior art includes the old type inclined drawing boards attached on stands. The angle of inclination of such drawing boards is adjustable. These stands and drawing boards are not portable.

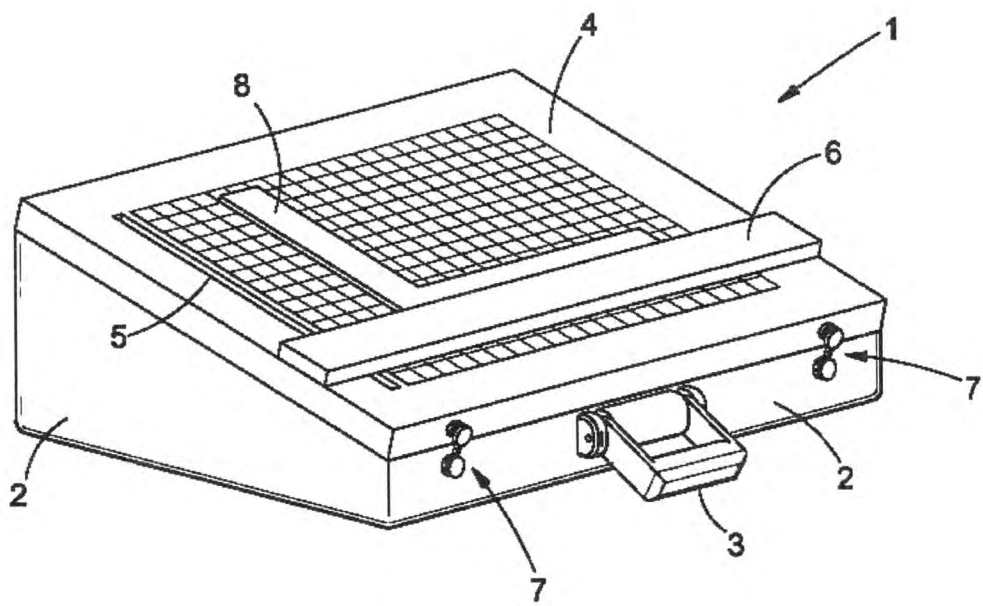
#### B. Question

Identify the inventive feature(s) of the invention and draft a claim to protect the invention.

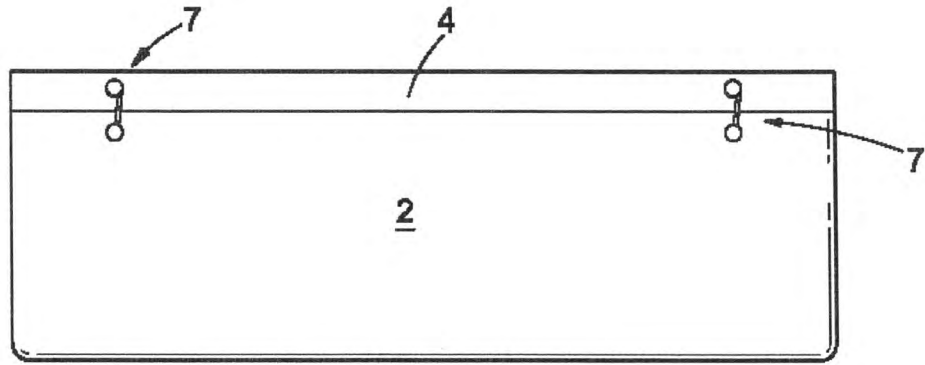




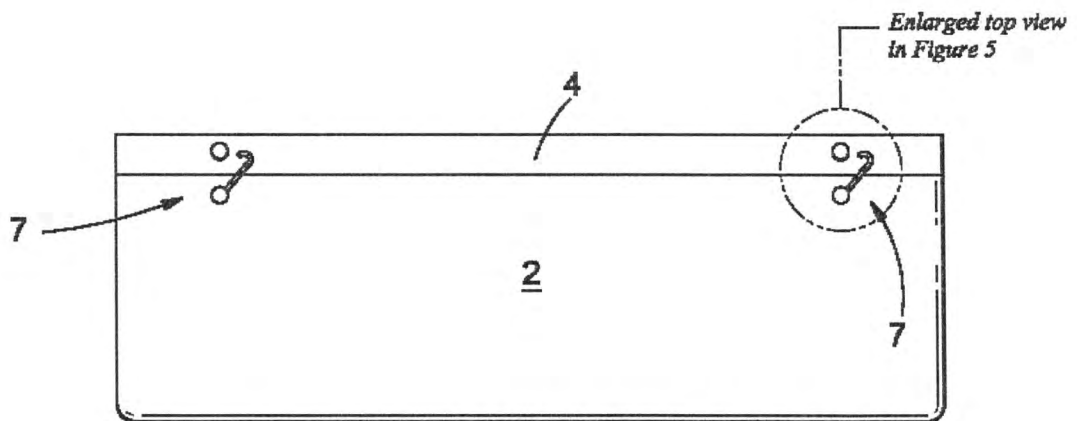
**FIGURE 1**



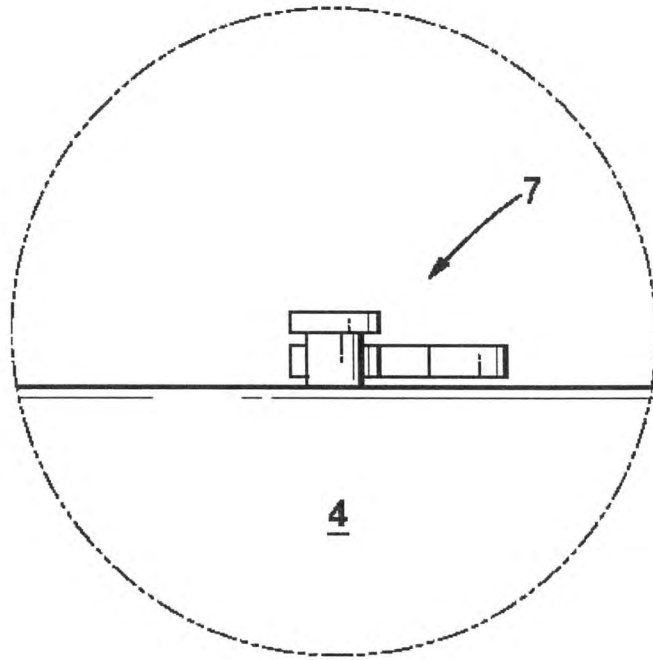
**FIGURE 2**



**FIGURE 3**



**FIGURE 4**



**FIGURE 5**