

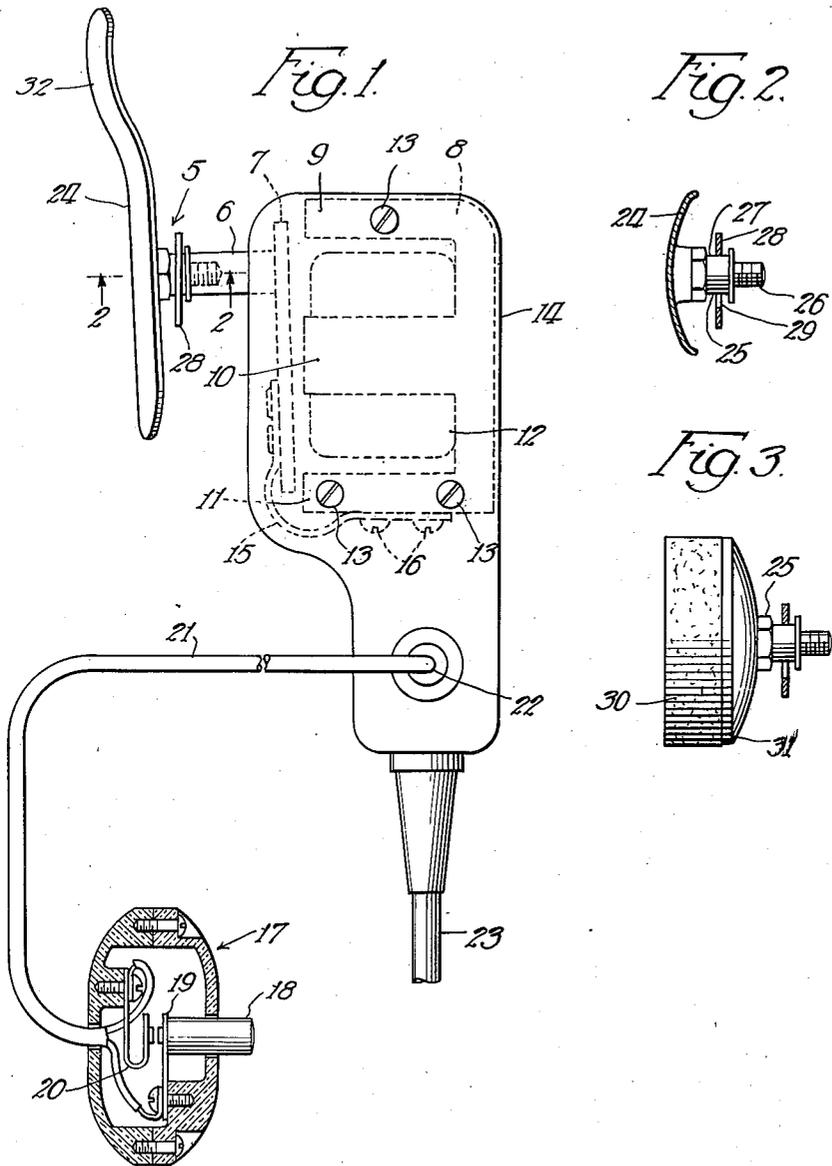
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MECHANICAL DISTRACTION METHOD AND DEVICE

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## MECHANICAL DISTRACTION METHOD AND DEVICE

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3 Claims. (Cl. 128-41)

The present invention relates to methods and means for the distraction and confusion of nerve functions in a patient, for the purpose of relieving the pain and shock of surgical treatments, and particularly of dental treatments. The invention is applicable to all types of dental operations. It has its place of assisting in examinations, needle insertions, extractions, chiseling and grinding the teeth, scaling and polishing the teeth, quick lancing, relieving tendencies to cough or gag, and, in certain instances, it has been found of particular advantage in resuscitating patients suffering from shock.

Experienced dentists use various methods such as directing conversation in the proper channels, attracting the visual attention of the patient in some manner and creating an atmosphere that will relieve the mental and physical tension of the patient. Such methods are directed primarily to the mind, and are of a visual and mental suggestive type. The present invention is directed to a method of distraction which combines mental distraction with actual physical contact and action and a substantial obtunding or numbing of the tissues and underlying nerves to serve as a delay function in reflexes to the brain centers.

The present invention contemplates the application of a vibrating unit in such a fashion as to combine mental distraction with physical contact and reaction, as well as the actual numbing of the tissues and nerves affected in the proposed operation. The present invention as applied to dental operations makes use of a specially designed vibration applicator which is applied to the skin surface in the area where it is most apt to create the desired numbness.

The special applicator is designed not only to impart vibrations to the body of a patient, but also to create certain noises that tend to overcome and drown out the noises of grinding and polishing, etc. on the teeth. The applicator is also arranged to require concentration of the patient's attention upon the applicator, rather than on the dental operation. To this end, the applicator is designed to require generally the use of both hands of the patient for its operation, that is, one hand to be used in holding the applicator at the proper place, and the other hand to be used in controlling the operation of the applicator.

The features and advantages of the present invention will appear more fully as the description proceeds, reference being had to the accompanying drawing wherein a preferred form of

the invention is shown. It is to be understood, however, that the drawing and description are illustrative only and are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawing, Fig. 1 is a view in side elevation, illustrating the preferred form of the vibration applicator;

Fig. 2 is a fragmentary sectional view taken substantially on the line 2-2 of Fig. 1 and illustrating the body-contacting element in cross section, and

Fig. 3 is a view in side elevation, partially in section, of a modified form of contacting element.

Referring now to the drawing, I have shown as an example of the vibration applicator a device comprising a contact element 5 which is removably attached to a work holding stem 6 of a vibrating armature 7. The vibrating armature 7 is adapted to be attracted and repelled by an electromagnet 8 consisting of a core having three pole pieces 9, 10 and 11. The pole piece 10 has an exciting coil 12 wound thereon. The electromagnet 8 is secured by screws 13 in a casing 14. The armature 7 is secured to the electromagnet 8 through a spring 15 and screws 16.

The mechanical structure of the means for operating the stem 6 is not new. Control of the supply of current to the electromagnet 8 is by means of a push button switch 17 having a button 18 adapted, when depressed, to bring contacts 19 and 20 together and complete the circuit from a suitable source of alternating current to the coil 12. The push button switch 17 is desirably placed in a separate cord 21 about two and one-half feet long and extending out of the side of the casing 14, as indicated at 22. The usual flexible cord for connecting the device to a source of alternating current is indicated at 23. In the use of the applicator the patient is told to hold the casing 14 in one hand and the switch 17 in the other hand. Thus it is necessary for the patient to keep both hands occupied in order to properly actuate the applicator.

The particular contact element 5 comprises an elongated plate 24 which is preferably transversely curved, as shown in Fig. 2, to present a convex surface on the side away from its attachment to the stem 6. The particular material of which the plate 24 is made is not of great importance. It should be of fairly rigid material, and it, of course, should be of a material that is easily kept clean and sterilized. The material should also be one that does not rust or corrode readily. A

metal plate properly treated to resist corrosion and rust has been found to be entirely satisfactory, although, of course, non-metallic materials could be used in the construction of the plate without in any way departing from the scope of the present invention. The plate 24 is attached to a stud 25 which has a screw threaded end 26 adapted to extend into a screw threaded socket in the stem 6. The stud 25 has a reduced portion at 27 which receives a thin ring 28. The ring 28 has its opening 29 somewhat larger than the reduced portion 27, and it is considerably narrower than the axial extent of the reduced portion 27, so that the ring is free to vibrate when the applicator is operated. The ring 28 is desirably constructed of metal so as to create a jingling noise of substantial intensity when the applicator is operated.

Whenever it is desired to have a different type of contacting element, a suitable type of element may be provided instead of the plate 24. Solid or yieldable materials such as soft rubber may have their place in the contacting elements. In Fig. 3 there is shown a contacting element having a soft rubber portion 30 secured to a backing 31 that, in turn, is connected to the stud 25 exactly the same as that shown in Fig. 2.

The particular contacting element shown in Figs. 1 and 2, however, has been found to be exceptionally useful for many purposes. Certain of the advantages are obtained because of the curved hump 32 found at one end of the plate 24. Examples of the advantages that appear to be present in this particular applicator are the following: It offers a rigid surface. Being of substantial length and area, it may be used to cover the several desired points of contact at one time. It may be used to extend along the whole lower jaw at one side. It will also cover the upper and lower jaw areas and the tragus of the ear at one time. In this use, the applicator produces tissue numbness and blocks the hearing at the same time. The rounded hump at one end of the contact element permits greater localizing pressure on a given area such as the inferior dental and infraorbital zones and the tragus of the ear. The loose metal ring produces a sound or jingle that is an added distraction to off-set the severe dental noises as they occur. The metal ring may, of course, be made inoperative by using a rubber band or similar device to hold it tightly to the stem.

The location of the control switch remote from the body of the applicator and the arrangement of the switch to require the patient to hold it serve to keep both hands of the patient busy and to keep the patient from using either hand to interfere with the dental operation.

The results that occur from the use of this method may be briefly summarized as follows: The patient is made less conscious of the dental operation due to the hand occupation and the noises without the mouth. The application of the contact element on the skin surface brings a numbing action to the nerves that is greater than the tooth stimulus up to the point of actual pain. The vibratory noises that pass into the ear canal when the applicator is placed on the tragus of the ear overcomes all dental noises that may travel through the bones of the face to the hearing organs. The vibratory action of the skin or soft tissues is usually greater than the stimulus caused by needle or surface lance operations. The nerve sense is, therefore, unable

to locate the exact point of pain and is therefore numbered in reaction.

There are two open or surface foramina, the infraorbital of the superior maxillary, and the inferior dental supplying the cuspid and incisor teeth of the gums and lower jaw that offer a greater response to this method due to the specially designed applicator. Direct pressure on these nerve structures which lie in the soft tissues and the communication of the vibrations thereto by the contact element causes a momentary anesthesia.

The disturbances to the facial and dental nerves which are set up by this method of applying a vibrating contact element confuses nerve reflexes to the brain centers sufficiently to be of definite aid to all dental operations. Any operation in and about the head, throat, ears and neck also benefits by the use of the present method. I have found that the use of this device, with most patients, immediately results in overcoming the initial fear. It provides a means of obtaining the cooperation of children without coaxing, and permits the operator to work for longer periods without interruption. The patients seem unable to judge the extent or nature of the operation, and do not flinch before actual pain occurs. Many patients become relaxed, rather than tense as the operation proceeds, and leave the dental chair with the thought of the applicator especially, rather than the memory of the dental operation. The vibration applicator is so arranged that by increased pressure upon the part of the patient a greater noise occurs and this overrides any operation noises that travel from the teeth or facial bones to the hearing organs.

It is not to be understood that the present device and method are intended to control pain in its real form. The purpose of the present invention is to provide an aid in patient control which will enable the intelligent operator to overcome the fear of the patient and the tendency of the patient to react in anticipation of pain. Actual numbing and distraction that is due to the physical or nerve reaction to the vibration will aid the operator in avoiding anticipatory reactions and fears, and in minimizing to the patient the actual pain and discomfort.

From the foregoing description it is believed that the nature of the present invention will be readily apparent to those skilled in this art. Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of producing a distraction and numbing effect upon a patient as an aid to dental operations and the like, which method comprises the application during the operation of a vibratory contact element to the skin surface adjacent the ear of the patient and setting up by means of said vibratory element an additional noise extraneous to the noise of the driving of the element and to the vibrations set up in the ear canal by the vibratory effect of the element upon the flesh and bone of the patient and tending to overcome noises incident to the operation.

2. A device for producing mental distraction of a patient undergoing an operation such as a dental operation, said device comprising a contact element, a power unit for vibrating the contact element, a flexible lead for supplying energy to the power unit, and a control device for said power unit flexibly connected to the power unit but spaced therefrom and separated from said flexible lead, said contact element

comprising an elongated convex plate having a connection intermediate its ends to the power element, and a loose metallic element carried by the connection between the contact element and the power device.

3. A device for producing mental distraction of a patient undergoing an operation such as a dental operation, said device comprising a con-

tact element, a power unit for vibrating the contact element, a stem connecting said power unit and said element, and a loose metal ring on said stem acting to create a distracting noise distinct from and in addition to the usual noise of operation of the power unit.

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