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(71)(72) Applicant and Inventor: SCHOON, Eduard, Peter, Ghislaine [NL/NL]; Zandweg 11, NL-6417 AS Heerlen (NL).

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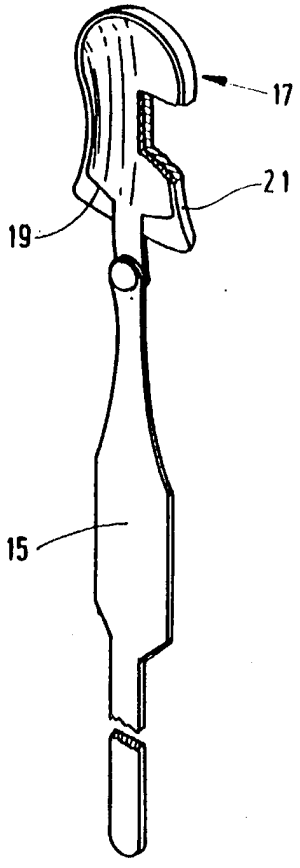
(54) Title: DENTAL COLOUR DEFINING CARRIER

(57) Abstract

A dental colour defining carrier to be used for defining the right colour of a jacket, a bridge or dental prothesis made of metal and porcelain to be fitted with a patient. For making a jacket of exactly the same colour as the other teeth in a patient's set of teeth, a dental colour defining carrier is used which is shaped as a slightly curved, thin-walled metal shield (19) which at its convex-curved part comprises a thinner, well reflecting basic layer. A similarly thin layer of porcelain is realised on top of this basic layer, the porcelain having a colour which may be selected from a range of desired dental colours. With a thus formed dental colour defining carrier it is possible to define a dental colour corresponding to the teeth adjacent to the jacket to be fitted, which dental colour very accurately matches the dental colour of the jacket or dental prothesis to be fitted.



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DENTAL COLOUR DEFINING CARRIER

The invention relates to a dental colour defining carrier to be used for defining the colour of a filling consisting of dental restoration materials, a facing, an inlay, a jacket, a bridge or dental prothesis to be fitted with a patient.

A carrier of this type is known per se and applied in a system comprising a plurality of strips in each of which there is a series of removable dental colour defining carriers of porcelain. Each carrier represents its own dental colour. By comparing this carrier to the remaining teeth of the patient's set of teeth, the dentist may establish which carrier of the series of carriers is the best match with the colour of the porcelain of a dental restoration to be fitted at a later time. The state of the art carriers are completely made of porcelain and have a pretty, transparent and translucent dental colour which largely corresponds to the colour of natural dental elements.

A drawback of the prior art method comprising a thus arranged dental colour defining carrier is that it is, however, less suitable for dental restorations to be fitted with a patient afterwards, which comprise, for example, porcelain and metal. These materials particularly reflect the incident light in a manner that may strongly differ from the reflection that occurs with a fully porcelain restoration. As a result, it appears that after the most suitable colour of the prior art dental colour defining carrier has been selected, when afterwards the dental restoration to be fitted is made, for which the established colour is reproduced as porcelain material, the dental restoration reveals a colour that may strongly differ from the colour of the adjacent dental elements; in that case it is not to be avoided that a dental element is to be made once again.

The invention provides a novel type of dental colour defining carrier for jackets or the like made of, for

example, ceramic metal material which can eliminate said drawback.

According to the invention, the dental colour defining carrier completely or largely comprises dental restoration materials which are identical with the dental restoration to be carried out and this dental colour defining carrier includes a guard-like, thin-walled shield at whose front preferably a thinner, well-reflecting basic layer may be provided, and furthermore a similarly thin layer of dental restoration material is provided on top of this basic layer, the layer of dental restoration material having a colour which may be selected from a range of desired dental colours. The novel dental colour defining carrier guarantees that a dental restoration to be carried out afterwards, for which ceramic material of the type of colour defined previously is processed in the dental technician's laboratory, will also really match the colour of the dental elements present adjacent to the dental restoration to be fitted.

The various aspects of the novel dental colour defining carrier as well as the dependent claims relating thereto will be discussed in further detail in the description below with reference to the drawing in which:

Fig. 1 shows in cross-sectional view a jacket made of, for example, porcelain and metal,

Fig. 2 shows in side view a known dental colour defining carrier,

Figs. 3/4 show in perspective view the dental colour defining carrier according to the invention in front view and rear view, Fig. 4 showing an interruption for clarity, and

Fig. 5 shows how the dental colour defining carrier may be positioned in a patient's mouth.

Fig. 1 shows in 1 in a coarse manner in a dashed line a part of the cross section of a jaw. For example, a jacket referenced 3 is to be fitted therein. In this case the jacket comprises a metal basic part 5, for example, of an alloy

containing palladium, on which a primary layer 7 of, for example, an opaque material may be deposited. Reference 9 is the porcelain material of the jacket 3 whose outer contours are adapted to the contours of the dental elements adjacent to the jacket. For defining the colour of the final jacket, it is known that a dental colour defining carrier shown in Fig. 2 is used. This carrier comprises a completely solid porcelain, profiled part 11 turnably attached to a strip-like support 13. This part 11 may be turned in the manner shown in Fig. 5 to be positioned in the patient's mouth. The dentist then has a large range of dental colour defining carriers of a wide range of colours at his disposal from which he may make a suitable selection. In the procedure to be executed he selects a dental colour that forms an optimum match with the patient's other teeth. Subsequently, the jacket having the selected colour is made in a dental technician's laboratory.

Practice has shown that it is substantially impossible to select a suitable colour with the known dental colour defining carrier when, eventually, a jacket comprising gold and, for example, porcelain is to be made. It so happens that such a jacket always turns out to have a harder colour than the desired colour, because this jacket is less transparent and translucent than the dental colour defining carrier selected by the dentist and completely made of porcelain. The metal guard and the basic layer of the jacket are non-translucent and are reflective to light.

For realising the right colour of the dental restoration to be carried out, one should take account of a plurality of elements which may impair each other, that is to say, the dentine, the selected dental colour defining carrier and the dental restoration made of dental restoration material. All these elements have their own colour factor and mutually unequal refractions of light. By utilizing the dental colour defining carrier shown in Fig. 2, the dental restoration afterwards made of, for example, metal and porcelain may exhibit a colour deviating from the other teeth and it is

often necessary to make yet again another jacket or dental prothesis.

According to the invention, this drawback is eliminated by utilizing a dental colour defining carrier of a composite type as is shown in Figs. 3 and 4. This carrier too contains a strip-like support 15 which is also turnable. The carrier itself is referenced 17 in Fig. 3. This carrier comprises a thin-walled shield 19 on which are deposited a thinner basic layer 20 and also a thin layer of porcelain 21 of a certain comparison colour, in this order. The composite carrier evolved in this manner actually comprises dental restoration materials which are comparable to the materials of the dental restoration to be made eventually. In this manner, the dental technician is thus able to make, for example, a jacket which has exactly the same dental colour as the colour of the composite dental colour defining carrier selected by the dentist and a true-to-nature colour of the jacket will be the result. The dental technician only needs to process dental restoration material having the same colour code as that of the restoration material of the composite dental colour defining carrier selected by the dentist.

In the embodiment shown there may be noticed that the dental colour defining carrier according to the invention has a contour which actually significantly corresponds to the shape of the front of the remaining teeth adjacent to the dental restoration to be fitted and the side has a shape which substantially corresponds to the mesial or distal side of the adjacent teeth where the dental restoration is planned. As a result of this shape and as a result of its utterly thin construction, the dental colour defining carrier may be completely held against the front of an adjacent tooth of the set of teeth, so that a substantially identical colour may easily be selected with the aid of the carrier.

In the embodiment described, the carrier 17 has a slightly bent shield 19 which is made of metal, for example, a

palladium-containing alloy and has a material thickness situated between 0.3 and 1.0 mm and which is preferably 0.6 mm thick.

Furthermore, this carrier 17 exhibits a basic layer of an opaque material whose thickness is about 0.5 mm.

Finally, the carrier 17 has a layer 21 of, for example, porcelain which has a material thickness between 0.4 and 1.8 mm and is preferably 1.0 mm thick.

It should further be noted that it is equally possible to manufacture the shields in one's own dental technician's laboratory according to the "lost wax-model method". According to this method it is assumed that, for example, a shield 19 of a suitable plastic material is burnt without a remainder. In this manner it is possible to manufacture the shield 19 of a suitable material alloy of one's own.

By offering the possibility of a dental restoration with exactly the desired dental colour being made in a single treatment, the system of the composite dental colour defining carrier is also referenced "TRUE COLOR SYSTEM".

In the foregoing the invention has been explained for a restoration material comprising porcelain and metal. Alternatively, the invention may obviously be applied to dental restoration materials comprising composites of plastic, glass, aluminium-oxide and other materials.

CLAIMS

1. A dental colour defining carrier to be used for defining the colour of a filling consisting of dental restoration materials, an inlay, a facing, a jacket, a bridge or dental prothesis to be fitted with a patient, **characterised in that** the dental colour defining carrier (17) completely or largely comprises dental restoration materials which are identical with the dental restoration to be realised and includes a guard-like, thin-walled shield (19) at whose front preferably a thinner, well-reflecting basic layer may be provided, and furthermore a similarly thin layer (21) of dental restoration material is provided on top of this basic layer, the layer of dental restoration material having a colour which may be selected from a range of desired dental colours.

2. The dental colour defining carrier as claimed in claim 1, **characterised in that** the dental colour defining carrier (17) exhibits a slightly curved shape which has a contour that mainly follows the shape of the front of a tooth and whose side substantially corresponds to the distal or mesial side of the adjacent tooth where the dental restoration is made.

3. A dental colour defining carrier as claimed in one of the preceding claims, **characterised in that** the shield (19) is made of metal, preferably of an alloy containing palladium.

4. A dental colour defining carrier as claimed in one of the preceding claims, **characterised in that** the basic layer is made of an opaque material.

5. A dental colour defining carrier as claimed in one or

several of the preceding claims, **characterised in that** the ceramic layer (21) is made of porcelain.

6. A dental colour defining carrier as claimed in one or more of the preceding claims, **characterised in that** the shield (19) has a thickness situated between 0.3 and 1.0 mm and is preferably 0.6 mm.

7. A dental colour defining carrier as claimed in one or more of the preceding claims, **characterised in that** the basic layer has a thickness situated between 0.3 and 1.0 mm and is preferably 0.6 mm.

8. A dental colour defining carrier as claimed in one or more of the preceding claims, **characterised in that** the layer (21) of ceramic material has a thickness situated between 0.4 and 1.8 mm and is preferably 1.0 mm.

9. A shield (19) suitable for application in the dental colour defining carrier as claimed in one of the preceding claims.

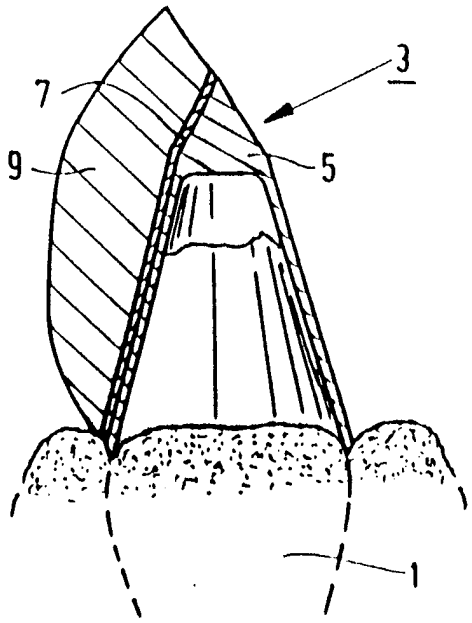

FIG. 1

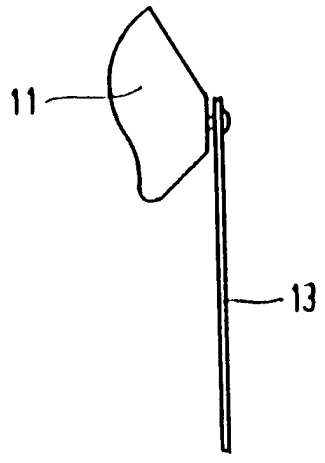

FIG. 2

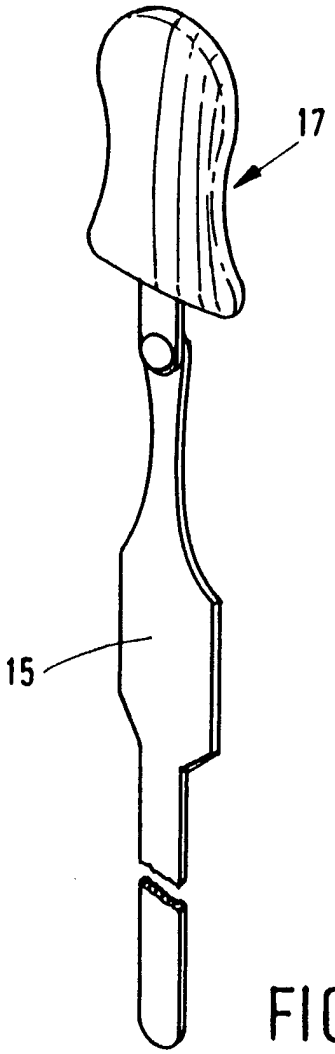

FIG.3

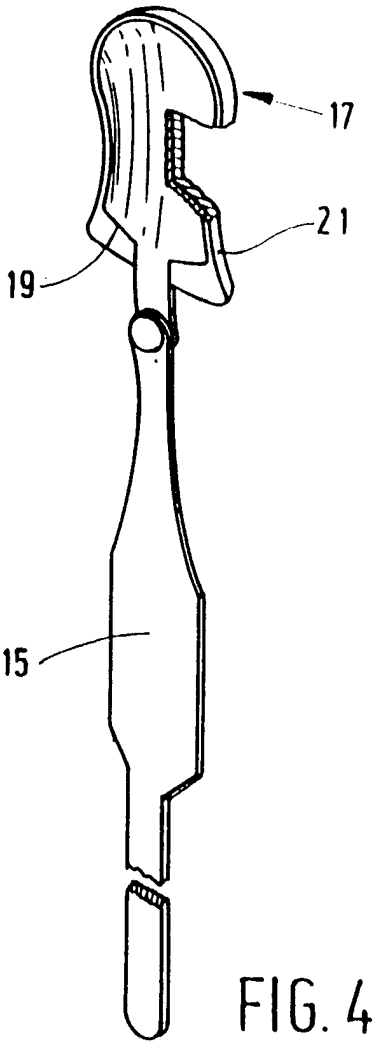

FIG.4

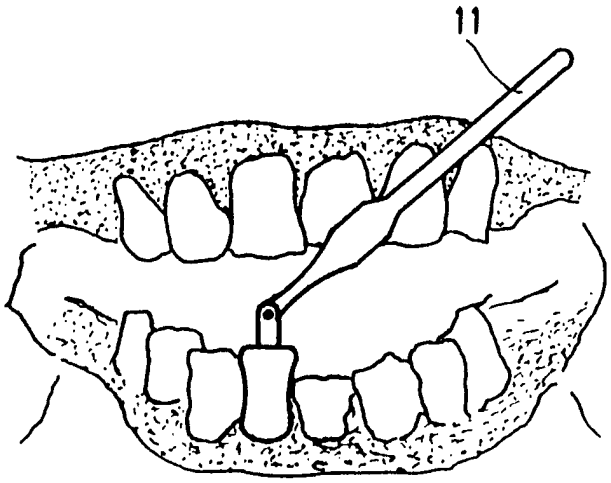

FIG.5

INTERNATIONAL SEARCH REPORT

Inte...ational Application No
PCT/NL 97/00652

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61C19/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 35 03 084 A (HERRMANN ROLF) 31 July 1986 see page 3, line 1 - line 4 see page 6, line 10 - line 13 see page 6, line 22 - line 31 see page 6, line 34 - page 7, line 11 see figures 1,2	1-6,8,9
A	---	7
X	US 2 756 504 A (HYMAN S. LEVINE) 31 July 1956 see column 1, line 17 - line 21 see column 2, line 1 - line 12 see figures 1,2	1,4,6,7,9
A	-----	2,3,5,8

[ ] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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1

Date of the actual completion of the international search	Date of mailing of the international search report
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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3503084 A	31-07-86	NONE	
US 2756504 A	31-07-56	NONE	