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(12) # EUROPEAN PATENT APPLICATION

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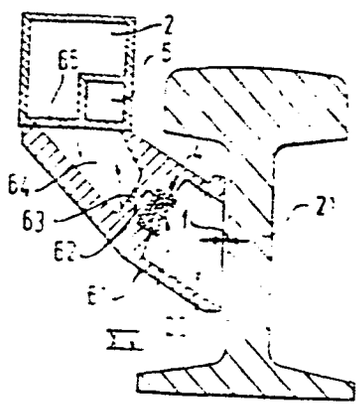
(54) **Burner for a points-heater.**

(57) A railway points-heater has a burner (3), the burner body (4) of which consists of a gauze packet instead of ceramic material, by which the heating-up time, in which the flame burning on the outside may extinguish, has been reduced.

FIG 4



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Burner for a railway points-heater.

The invention relates to a burner for a railway points-heater comprising a burner housing and at least one burner body arranged in said housing and having passages.

Such a burner is known from German Patent Specification 1,111,661. Herein the burner body consists of a burner stone. In order to prevent extinction of the flame during a storm or during the passing of trains by a gust of wind, the combustion channels have such a width that the gas/air mixture passing through the combustion channels already ignites in the combustion channels. This burner stone requires a long heating-up time until it reaches such a degree of heat that ignition can take place in the burner stone. During this heating-up time the flame may be extinguished by a gust of wind. The burner stone can be rendered suitable for all kinds of gas only with difficulty. The burner stone has, in particular, the disadvantage that it can be made only with difficulty and is likely to break down due to vibrations.

The invention provides a burner of the kind set forth in the preamble, in which the risk of extinction of the flame, even a short time after ignition, is avoided, and which as regards a flash-over of the flame to the gas-air mixture feed is absolutely safe, even in the event of appreciable variations in the gas-to-air ratio, in the chemical composition of the gas and/or the output of delivered heat, said burner being readily manufacturable and being capable of withstanding vibrations, since the burner body mainly consists of a gauze packet within which the combustion takes place.

The gauze packet preferably comprises at least three and preferably more than three wire-nettings succeeding one another in the direction of flow.

The aforesaid and further features of the invention will be described more fully hereinafter with reference to a drawing.

The drawing shows schematically in

Fig. 1 a plan view of railway points having a points-heater provided with burners in accordance with the invention,

Fig. 2 an enlarged, perspective view, partly broken away, of a detail of a points-heater having burners as shown in Fig. 1,

Fig. 3 an enlarged perspective and exploded view, partly broken away of a burner of the points-heater shown in Fig. 1,

Figs. 4 and 5 an enlarged sectional view of a burner in operation with a rail taken on the line IV-IV and V-V respectively in Fig. 2,

Figs 6 and 7 a front and side view respectively of detail VI of Fig. 3,

Figs 8 and 9 a front and side view respectively of detail VIII of Fig. 3,

Figs. 10 and 11 a front and side view respectively of detail X of Fig. 3,

Figs. 12 and 13 a front and side view respectively of detail XII of Fig. 3,

Fig. 14 on an enlarged scale detail XIV of Fig. 4,

Figs. 15, 16 and 17 each a variant of detail XIV,

Fig. 18 an enlarged sectional view XVIII-XVIII of Fig. 2,

Fig. 19 detail XIX of Fig. 1 and

Fig. 20 a perspective view, partly broken away, of a different burner according to the invention.

The railway points-heater 60 comprises a gas/air mixing apparatus 1 having a gas manifold 17 connected with a gas pipe 16 and an air suction hood 18. The air is sucked in with the aid of the gas fed in under pressure. The gas/air mixture flows through a common burner pipe 2 connected with the mixing apparatus 1 towards a plurality of burners 3. The burners 3 each comprise a burner housing 61 and a burner body 4 arranged therein and having passages. The passages establish a communication between a flame chamber 23 facing a rail 21 and a gas distribution chamber 62 extending in the direction of length of the burner 3. The gas distribution chamber 62 communicates through a slot 63, a cavity 64 and an opening 65 of the burner pipe 2 with said burner pipe 2.

Parallel to the burner pipe 2 is arranged a flash-over pipe 5, which communicates through an aperture 66 of the flash-over pipe 5, a channel 67 and through an aperture 68 in the holder 69 of the burner body 4 with the flame chamber 23. The flash-over pipe 5 is united with the burner pipe 2 to a profile. Midway between the burners 3 the flash-over pipe 5 communicates with the burner pipe 2 through gauze 14, which is fastened by a screw head 25 to a tie piece 6. This tie piece 6 is screwed into a nipple 32 arranged between the flash-over pipe 5 and the burner pipe 2 (see Fig. 18).

The burner according to the invention comprises an ignition device. For each rail this device comprises only one

electric ignition member 15. The electrodes 8 and 38 of the ignition member 15 are located in the flash-over pipe 5 and are connected to a pulse producer 26 providing periodically a voltage pulse of 20kV in periods of 20 to 15 seconds.

According to the invention the burner body 4 mainly consists of a gauze packet within which the combustion of the gas takes place, as a result of which the burner is not blown out by wind produced, for example, by a passing train. The burner body 4 comprises a gauze holder 69 of U-shaped profile. This gauze is formed by a perforated plate which distributes the gas at a flow resistance of 0.5 to 1 mmwk. in the direction of length of the burner 3. The circular perforations 70 may have a diameter of 1 mm and a relative distance of 2 mm.

Inside the holder 69 preferably at least three and most preferably more than three, for example, six gauze plates 71 preferably of expanded material are arranged in superposition, said plates having rhombic meshing 72 of a length a of 8 mm and a width b of 4 mm, the wire width being 0.7 mm. The directions of length 73 and 74 of these rhombic meshes of the gauze plates 71 are alternately transverse of one another. Beneath the gauze plates 71 adjacent the gas distributing body of the U-shaped holder 69, there is arranged a flame extinguishing gauze 75 of 40 to 80 mesh. The entire gauze packet consists of refractory gauze and has a flow resistance of 1 to 3 mmwk. The gauzes 71 and 75 are retained in the holder 69 by bent-over tags 76 of the holder 69. Above the apertures68 the holder 69 does not contain gauzes 71, 75, but at this area the limbs 77 of the U-shaped profile are bent over towards one another.

According to the invention, as described above and represented in the drawing, a simple infrared burner is provided, which runs at a temperature of 800 to 1000 degrees C. and which is wind-resistant with a low pressure drop, its length t being 9 cm and its width s 1.5 cm in the burner body 4 having a combustion capacity of about 60 g of propane/hour or 0.09 m^3 /hour of normal natural gas, which corresponds to 600 to 750 kcal/hour. The gauzes 71 may, though not prefe-

rably, have meshes of twice said size or smaller meshes, for example, 20 mesh. The distance f of the burner 3 from the rail 21 may be 2 to 4 mm.

The railway points-heater 60 according to the invention operates as follows:

Before the winter begins, a closing member 48 is opened. As long as the rail temperature remains below 2 degrees C. the thermostat 50 controlled by a thermometer 59 is open and gas flows out of a reservoir 47 and is reduced at the reducing valve 49 to a pressure of, for example, 0.3 ato and fed into the gas pipe 16. In the burner pipe 2 a gas/air mixture is formed, which flows through the connecting pipes 13 to all burners 3. In addition, the flash-over pipe 5 is filled with this mixture through the gauze 14, though at a lower pressure than that prevailing in the burner pipe 2. A spark produced at the electrodes 8 and 38 ignites the mixture in the flash-over pipe 5, the flame passing to the flame chambers 23 of the burners 3 and igniting the burners 3. The subsequent sparks of the ignition member only serve as monitoring sparks in the event all burners 3 would be extinguished. If the ignition member 15 does not periodically produce a spark, an extinguished burner 3 will nevertheless be ignited by the other burners 3. Since the gas/air mixture constantly flows through the gauzes 14 into the flash-over pipe 5, this pipe is each time filled with this mixture during periods of, for example, 10 seconds and from the flame chambers 23 of the burning burners 3 and/or by the ignition member 15 it is ignited. This flame may pass to the flame chamber 23 of an extinguished burner 3, which is thus ignited. The gauze 14 prevents the flame of the flash-over pipe 5 from passing into the burner pipe 2.

The gas conduit 16 may be connected with a natural or synthetic gas means instead of being connected with a gas reservoir.

Referring to Fig. 15 the gauze packet has only two gauze plates 71 and an extinction gauze 75 in a holder 69.

Referring to Fig. 16 the extinction gauze 75 is arranged on the side of the holder 69 facing the gas distri-

bution chamber 62.

Referring to Fig. 17 the gauze packet comprises apart from the holder 69 and a gas extinction gauze 75, a wound-up gauze 80 of expanded material corresponding to the gauze plates 71.

The burner 81 of Fig. 20 is longer than the burner 3 and has in a housing two cavities having two separated gas distribution chambers 62, but one uninterrupted burner body 4 and only one channel 67.

Burner for a railway points-heater

CLAIMS

1. A burner for use in a railway points-heater comprising a burner housing and at least one burner body arranged therein and having passages, characterized in that the burner body mainly consists of a gauze packet of at least three and preferably more than three gauze plates succeeding one another in the direction of flow, inside which the combustion takes place.

2. A burner as claimed in claim 1, characterized in that the burner body comprises a gauze holder and a U-shaped profile.

3. A burner as claimed in claim 2, characterized in that the holder retains a plurality of gauze plates retained by means of bent-over tags of the holder.

4. A burner as claimed in anyone of the preceding claims, characterized in that the burner body comprises at least one gauze of expanded material.

5. A burner as claimed in anyone of the preceding claims, characterized in that the burner comprises a plurality of gauze plates having rhombic meshes, whose directions of length are alternately transverse of one another.

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FIG.1

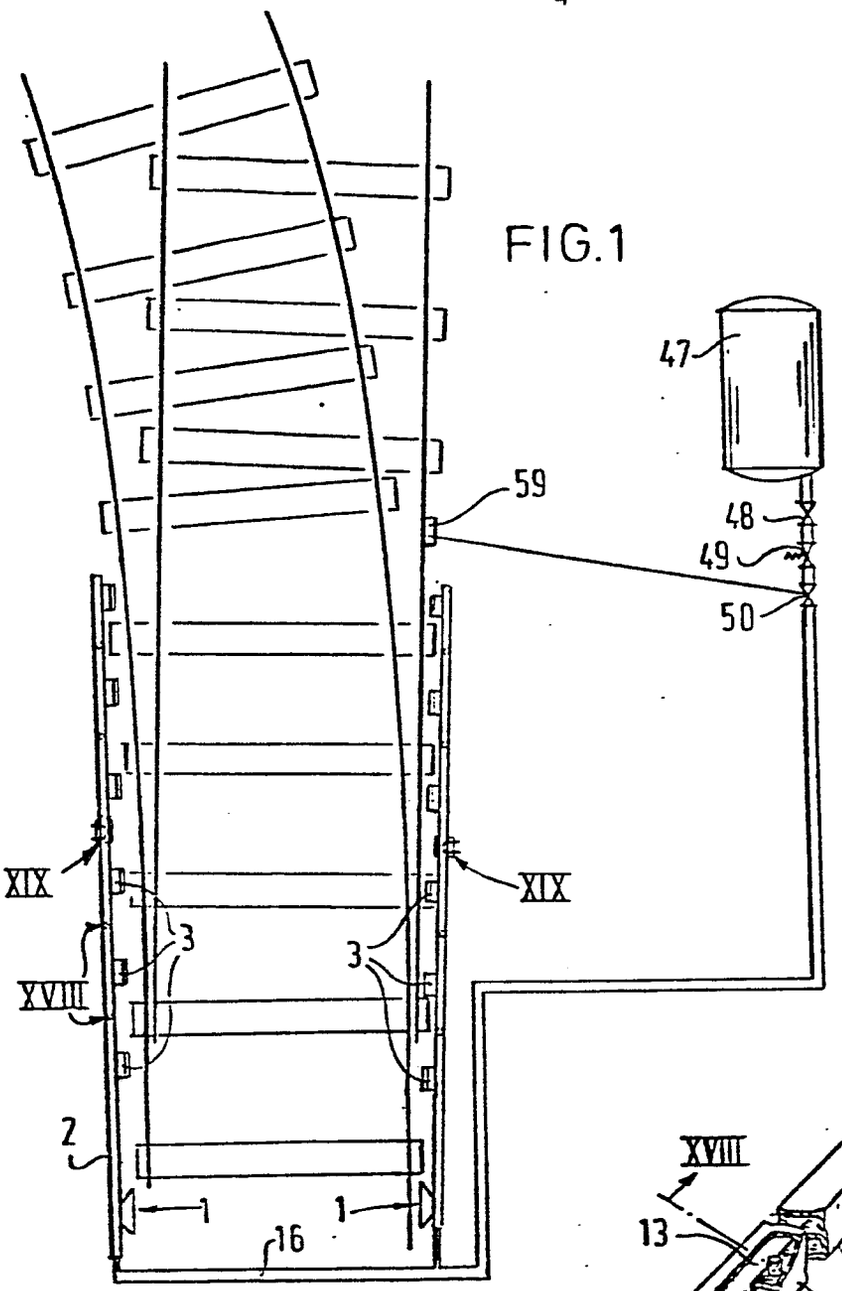

FIG.2

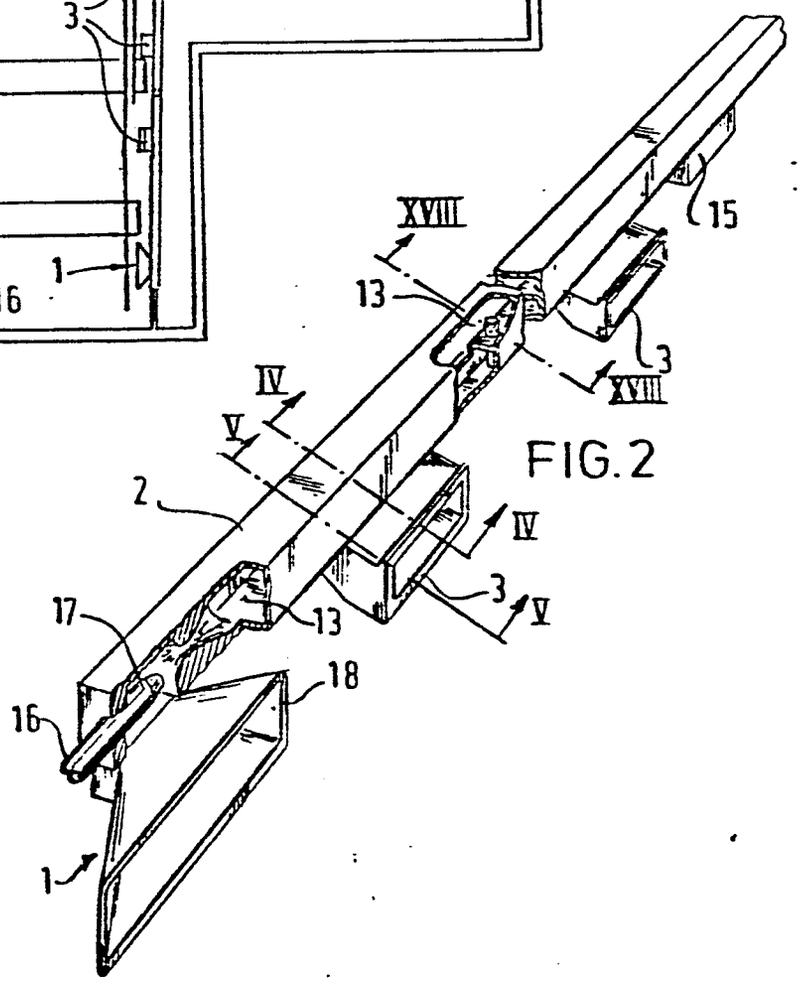

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FIG. 3

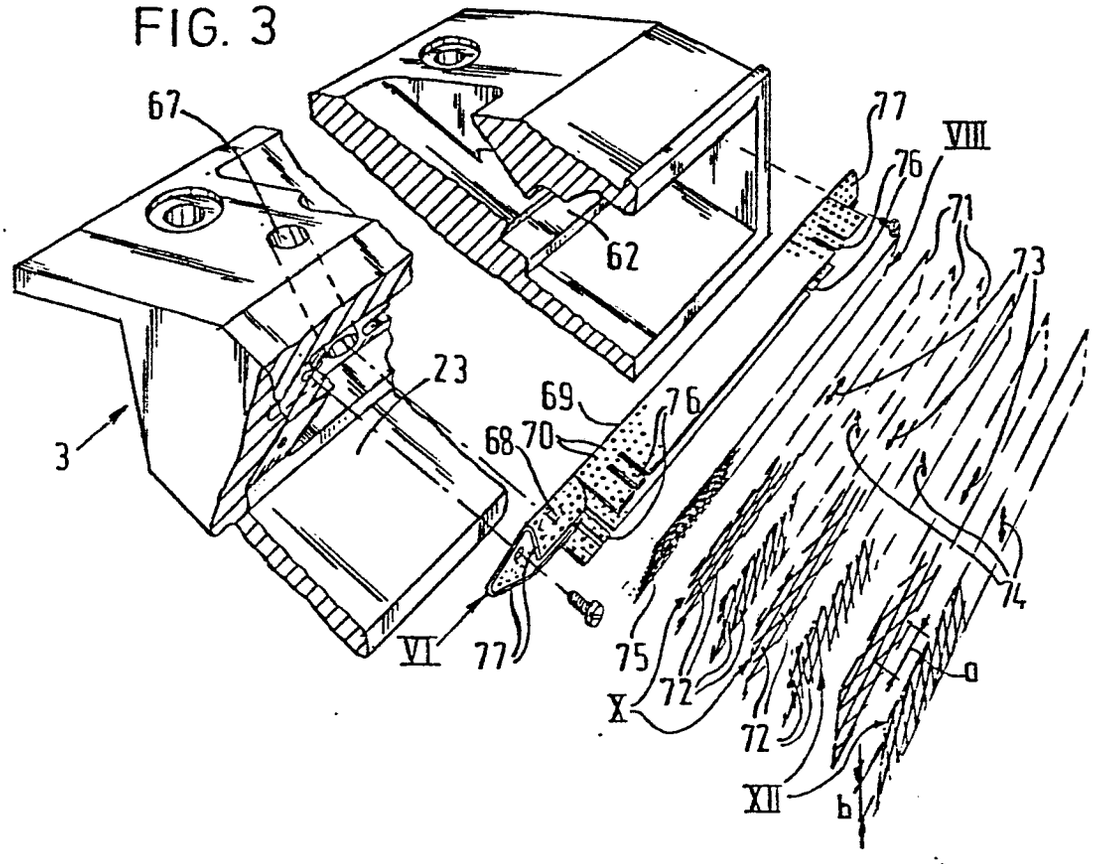


FIG. 4

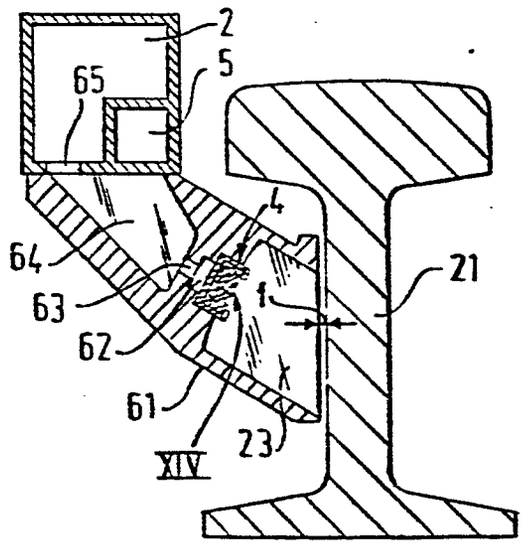
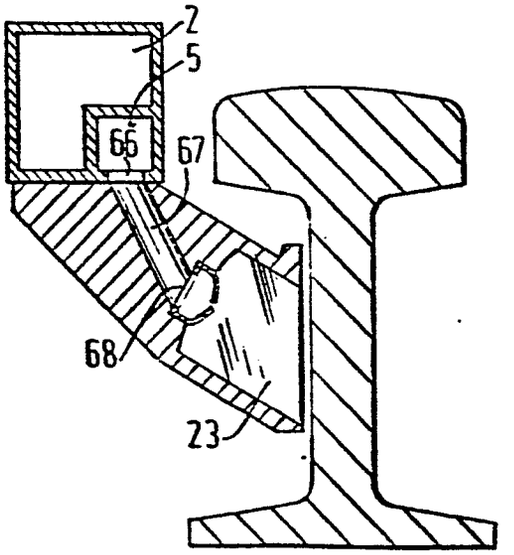


FIG. 5



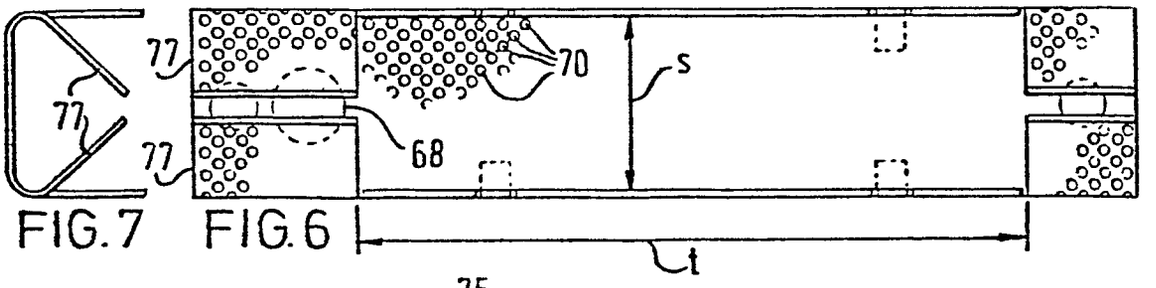


FIG.7 FIG.6

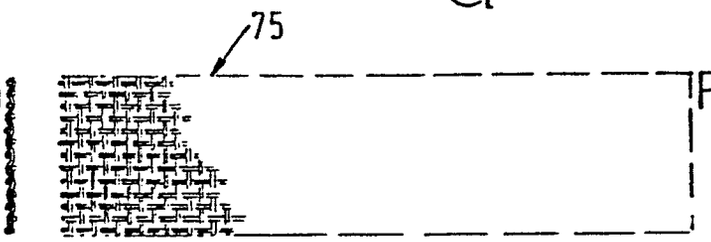


FIG.9 FIG.8

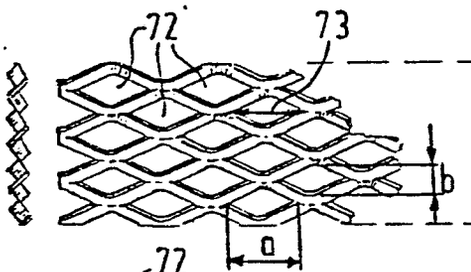


FIG.11 FIG.10

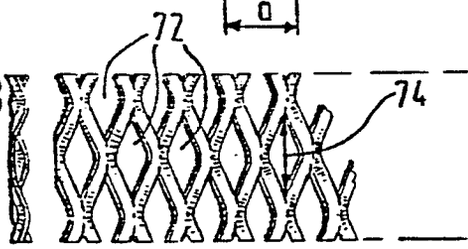


FIG.13 FIG.12

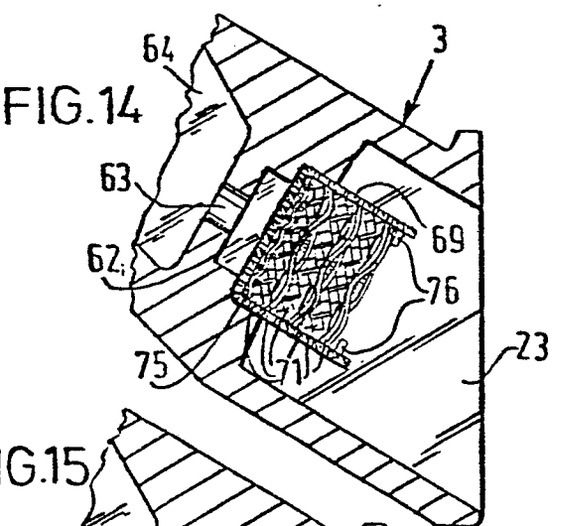


FIG.14

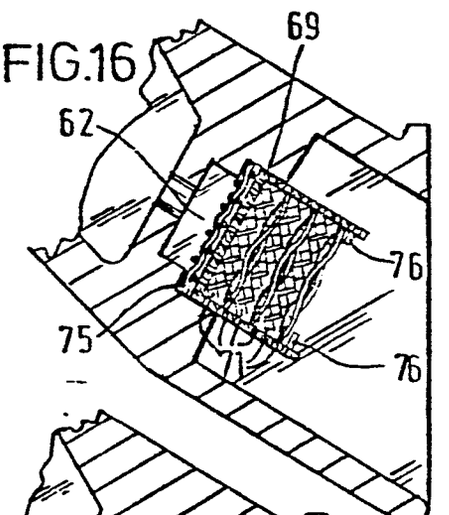


FIG.16

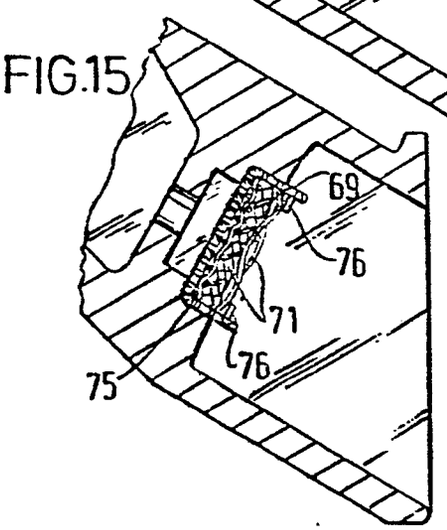


FIG.15

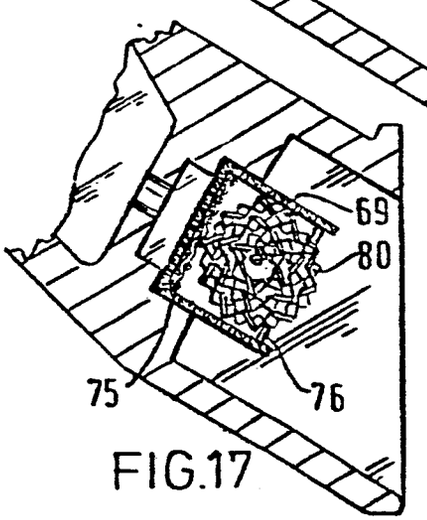


FIG.17

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FIG. 18

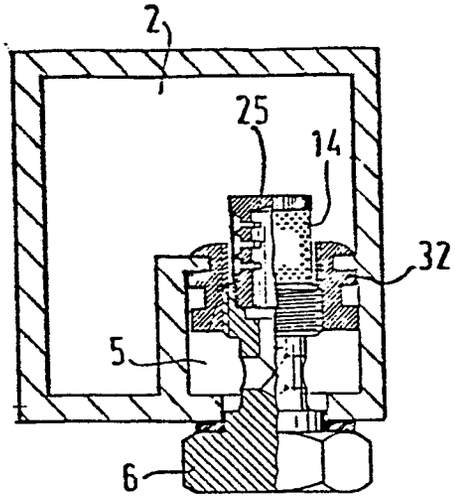


FIG. 19

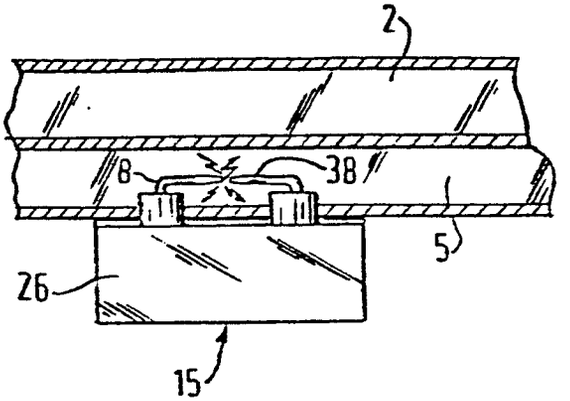
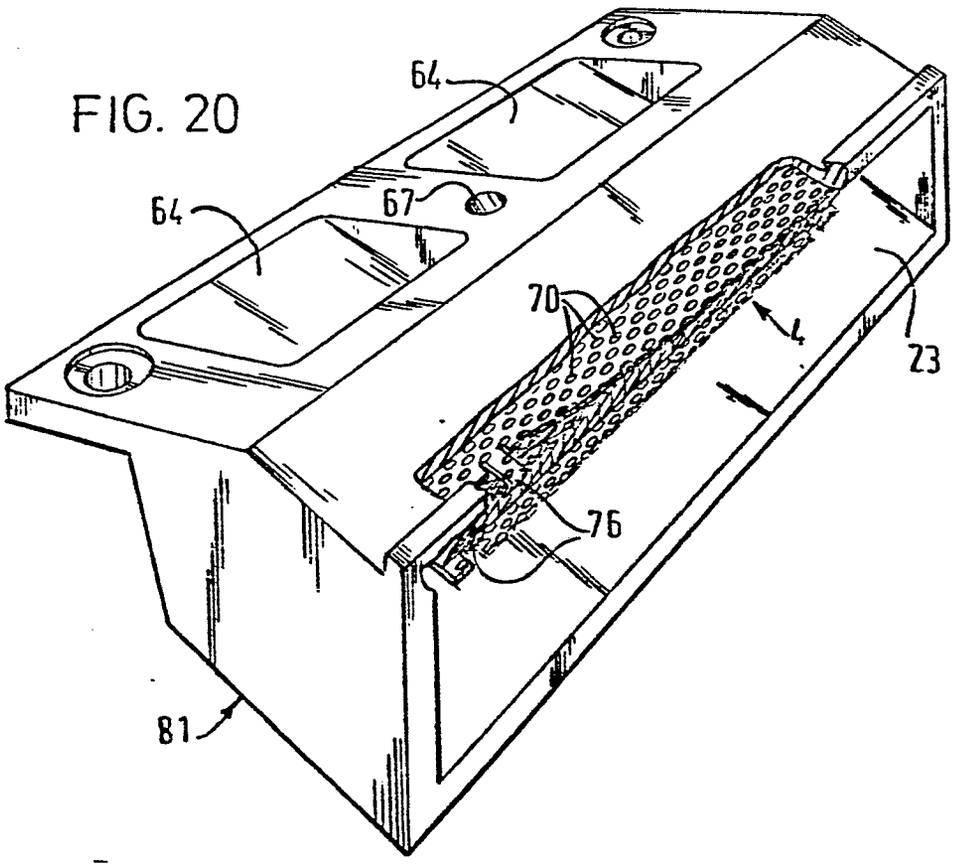


FIG. 20



European Patent Office

EUROPEAN SEARCH REPORT

Application number EP 80 20 0021

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	US - A - 2 815 747 (GREENFIELD) * Column 2, lines 7-26; figures 1-6 *	1,3
	FR - A - 2 292 928 (INT. MAGNA) * Page 3, lines 35-36; page 4, lines 1-13; figures 1,2,6,7,9 *	1,6
	FR - A - 1 439 978 (BRILLOIS) * Page 1, left-hand column, last paragraph - page 1, right-hand column, first paragraph; figure 2 *	1
	US - A - 3 304 985 (LYNES) * Column 1, lines 46-56; column 2, lines 22-25; figures 1-3 *	1
A,D	DE - B - 1 111 661 (HUISINGA)	

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)

E 01 B 7/24
F 23 D 13/14

TECHNICAL FIELDS SEARCHED (Int Cl.)

E 01 B
F 23 D

CATEGORY OF CITED DOCUMENTS

X. particularly relevant
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E conflicting application
D. document cited in the application
L citation for other reasons

& member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24-03-1980	RUYMBEKE

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