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(54) Submarine escape assembly.

(57) A submarine escape assembly comprises a waterproof suit (10) to which is integrally attached a container (20) for a deployable liferaft. The liferaft has its own inflation source which is actuated by means of a handle (21) on the container (20). The suit (10) includes an inflatable buoyancy stole (11) which is inflated through a valve (18) from the submarine's inflation source. An integral cord or lanyard is used to attach the liferaft to the container (20).

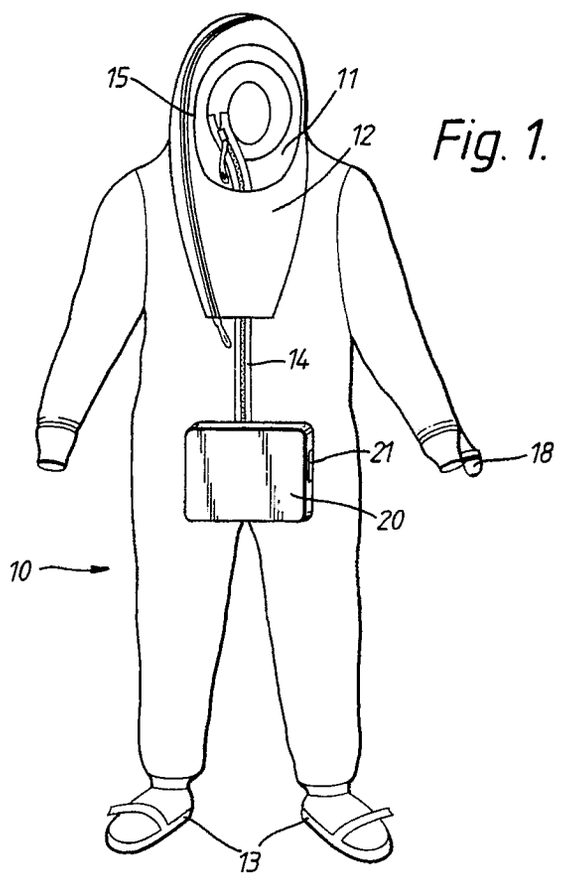

Fig. 1.

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This invention relates to a submarine escape assembly and in particular to a submarine escape assembly comprising a waterproof suit together with a deployable liferaft.

Many types of submarine escape suits are known and one of the most commonly-encountered of such suits consists of a flotation garment of an air-retaining material, the garment including an inflatable portion such as a buoyancy stole.

Although such suits provide flotation and insulation for the user, the need to keep the body of the suit inflated after surfacing results in the wearer being made to float in a supine position, often for several hours, before being rescued. Prolonged floating in a supine position can cause disorientation and frequently seasickness, leading to the additional hazard that the user might asphyxiate by inhalation of vomit.

The object of the present invention is to provide the user of an escape suit with a personal rescue craft, so that the hazards of prolonged floating on the surface while awaiting rescue can be minimised.

Accordingly, the present invention provides a submarine escape assembly comprising a waterproof suit to which there is integrally attached a container for a deployable liferaft.

Preferably, both the suit and the liferaft each include at least one inflatable portion. For example, the suit may include an inflatable buoyancy stole and the liferaft may include an inflatable buoyancy tube.

The liferaft may conveniently be provided with its own inflation source and a handle or other actuation means for that inflation source may be provided on the integral container.

In order to prevent loss of the deployed liferaft, an elongate cord or lanyard may be provided to join the liferaft permanently to the integral container.

The suit may conveniently be made of a single layer of a flexible waterproof material. This facilitate storage of the suit/liferaft assembly prior to use.

The liferaft may be provided with a canopy and this, too, may suitably be made of a flexible waterproof material.

The present invention will be illustrated, merely by way of example, in the following description and with reference to the accompanying drawings.

In the drawings (wherein like numerals denote like parts) :

Figure 1 is a view of a submarine escape assembly according to the present invention;

Figure 2 shows, in its deployed condition, a liferaft forming part of the assembly of Figure 1;

Figures 3 to 7 show, in sequence, the operation of the assembly following surfacing.

Referring to Figures 1 and 3, a suit 10 is made from a single layer of a waterproof fabric and includes an inflatable buoyancy stole 11 with an integral hood 12, overshoes 13, waterproof slide-fasteners 14 and 15 to close the suit 10 and hood 12 respectively, together with a container 20, attached permanently to the outer surface of the suit 10, for a liferaft. A handle 21 is provided on the container 20 for the actuation of inflation means for, and deployment of, the liferaft. The suit 10 is further provided with manually-operable valves 16 and 17 venting from the stole 11 into the hood 12, together with an inflation valve 18 for connection to an external inflation source and connected, via the stole 11, to valves 16 and 17 by means of a tube (not shown).

Referring to Figures 2 and 7, a liferaft 30 comprises a buoyancy tube 31 adapted to be inflated from an inflation source 32 through a valve 33, together with a canopy 34 of a flexible waterproof material. The canopy 34 serves as a protective cover for the occupant of the liferaft and may include a transparent face shield 35. The liferaft may additionally be provided with other customary accoutrements, for example a drogue 36, grab-handles 37 and 38 and stabilising pockets 39. The material of the canopy may be of a conspicuous fluorescent colour and other location aids (such as lights) may be provided on the liferaft.

In an escape situation, the assembly according to the present invention operates as follows :

The user dons the suit and inflates the buoyancy stole 11 from the submarine's inflation source through valve 18. At this point, valves 16 and 17 are in the "open" condition so as to vent the buoyancy stole pressure into the hood 12 and provide air for the user to breathe during ascent.

After surfacing, the user opens the hood 12 and immediately closes valves 16 and 17 so as to retain air in the buoyancy stole 11. This permits the user to float on the surface of the water while the liferaft is deployed. (Figures 1 and 3 of the drawings).

The user then operates the handle 21 on the container 20. This actuates the liferaft inflation source. (Figure 4 of the drawings).

The liferaft 30 inflates, remaining attached to the user by means of an integral lanyard 40. (Figure 5 of the drawings).

Finally, the user boards the liferaft and erects the canopy 34. (Figures 6 and 7 of the drawings).

Claims

1. A submarine escape assembly, characterised by a waterproof suit (10) to which there is integrally attached a container (20) for a deployable liferaft (30).

2. An assembly according to Claim 1, characterised in that the suit (10) and the liferaft (30) each include at least one inflatable portion.

3. An assembly according to Claim 2, characterised in that the suit (10) includes an inflatable buoyancy stole (11).

4. An assembly according to Claim 2 or 3, characterised in that the liferaft (30) includes an inflatable buoyancy tube (31).

5. An assembly according to Claim 2, 3 or 4, characterised in that the liferaft (30) includes an inflation source (32).

6. An assembly according to Claim 5, characterised in that the liferaft inflation source (32) is actuated by means of a handle (21) provided on the integral container (20).

7. An assembly according to any one of the preceding claims, characterised in that the liferaft (30) is permanently attached to the integral container (20) by means of an elongate cord or lanyard (40).

8. An assembly according to any one of the preceding claims, characterised in that the suit (10) is made of a single layer of a flexible waterproof material.

9. An assembly according to any one of the preceding claims, characterised in that the liferaft (30) is provided with a canopy (34) of a flexible waterproof material.

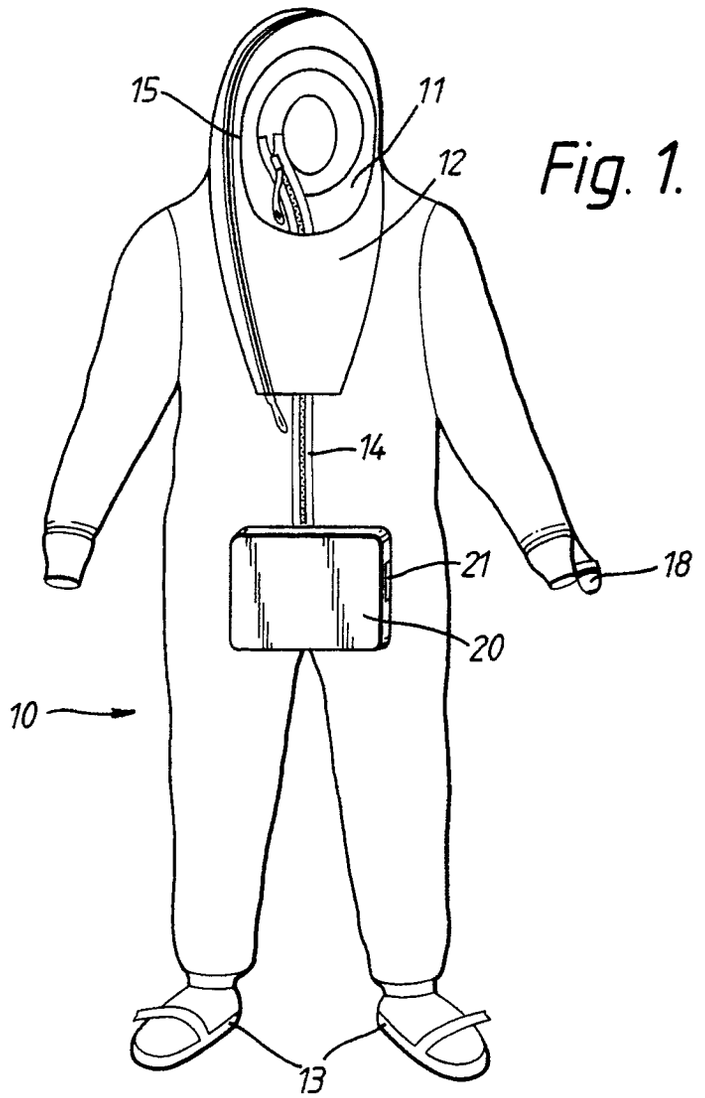
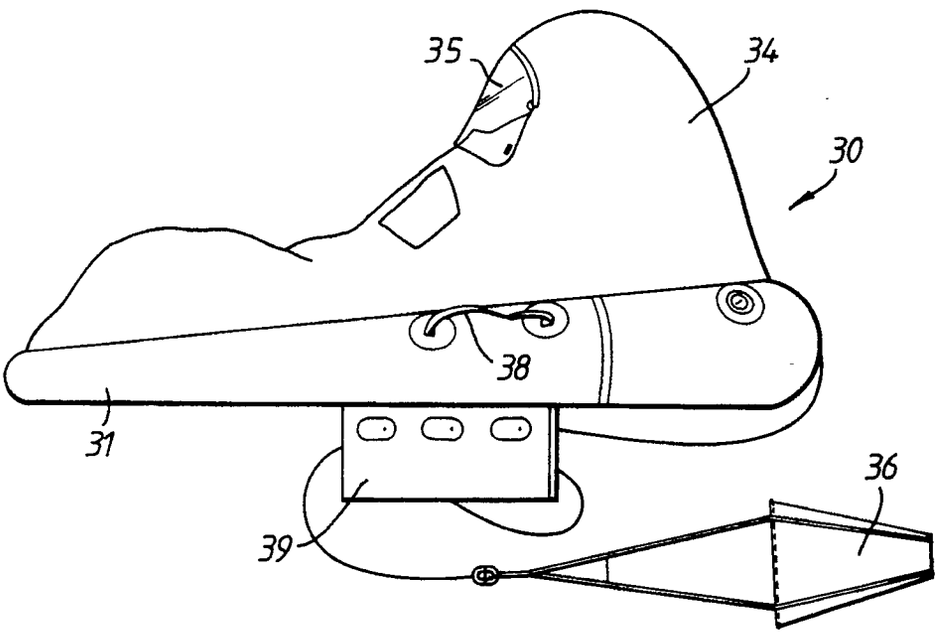


Fig. 1.

Fig. 2.



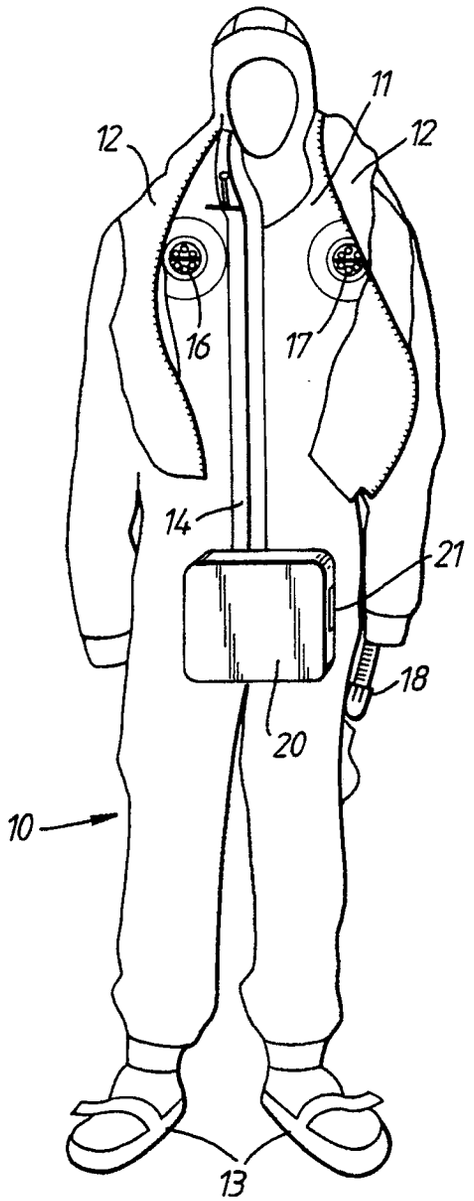


Fig. 3.

Fig. 4.

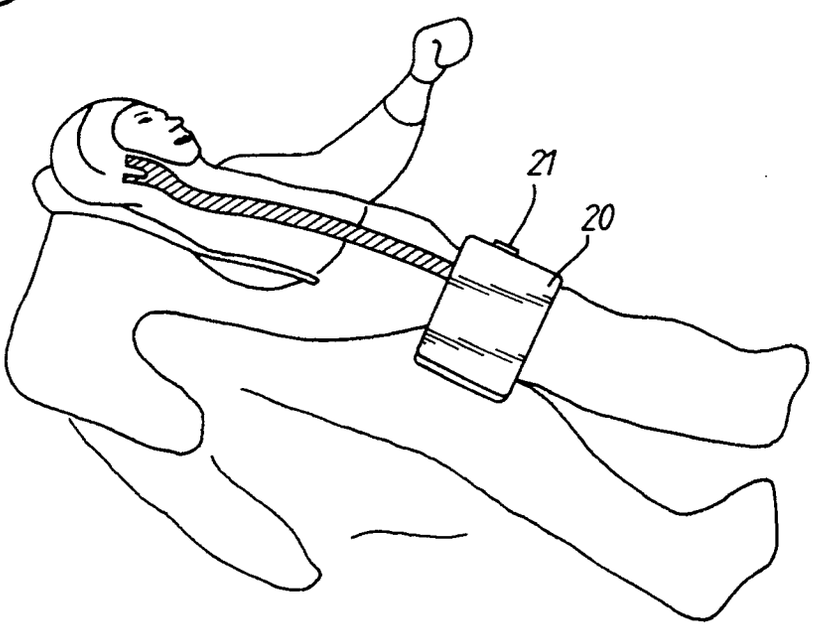


Fig. 5.

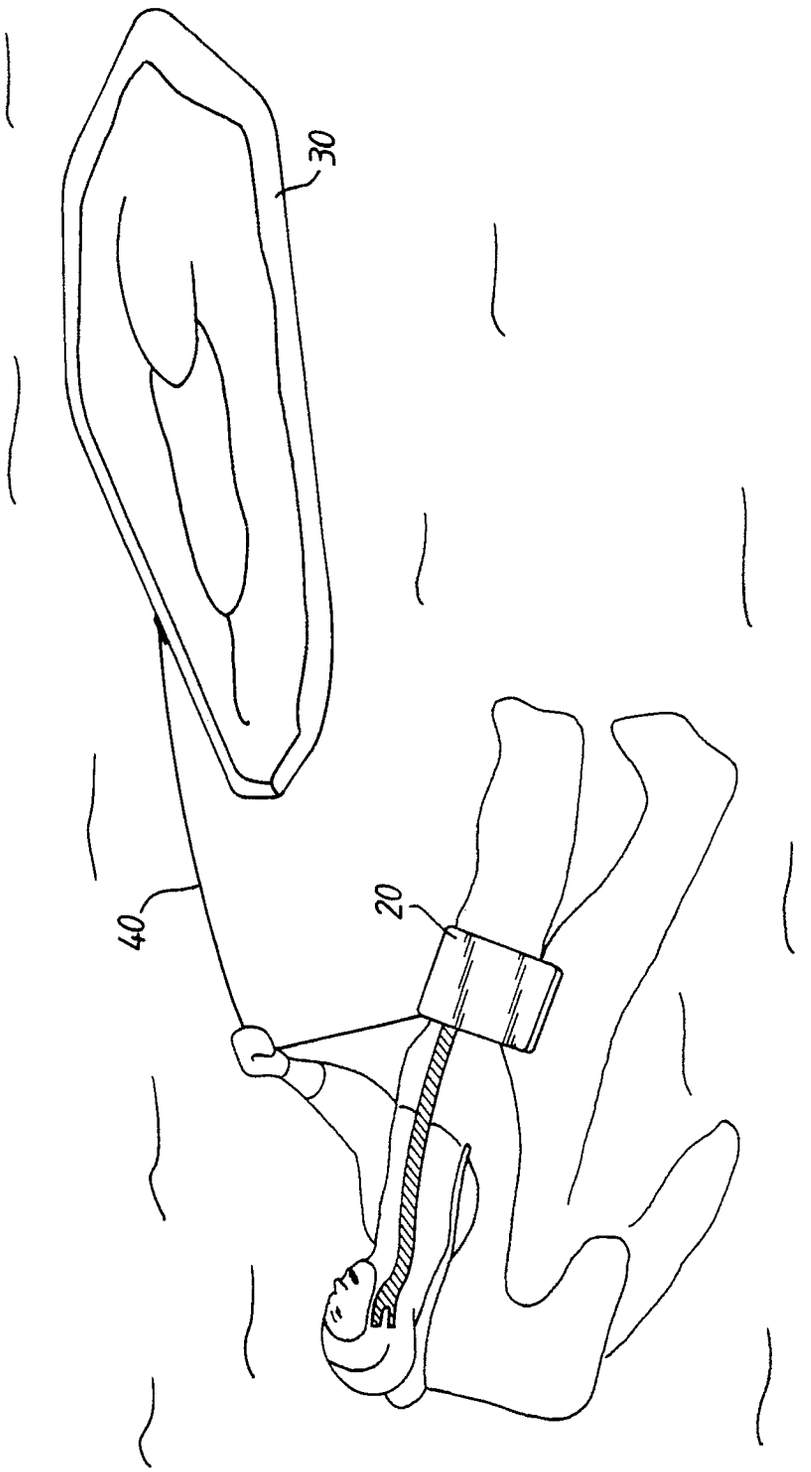


Fig.6.

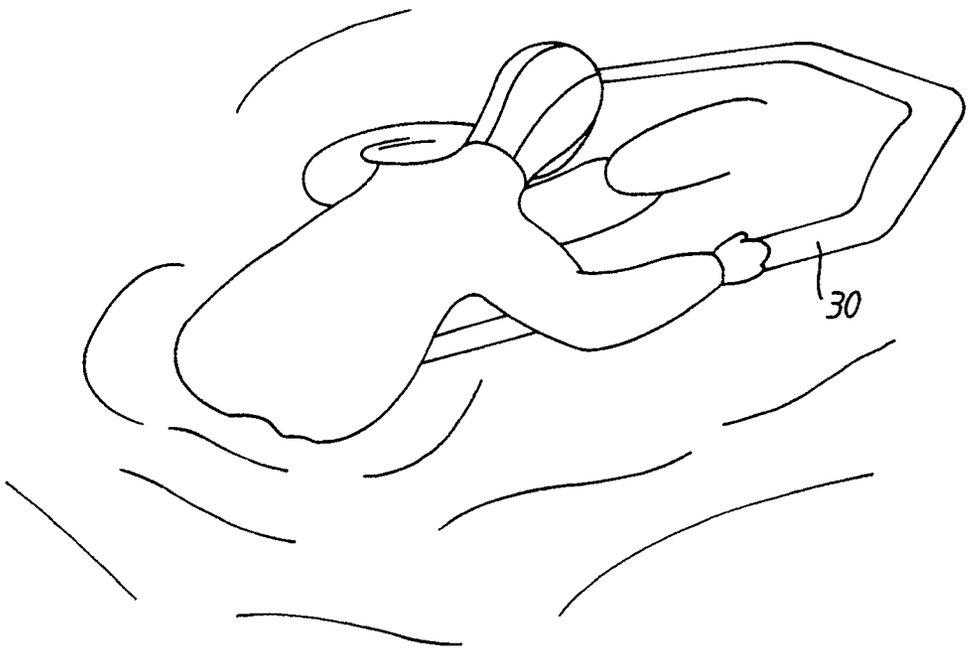
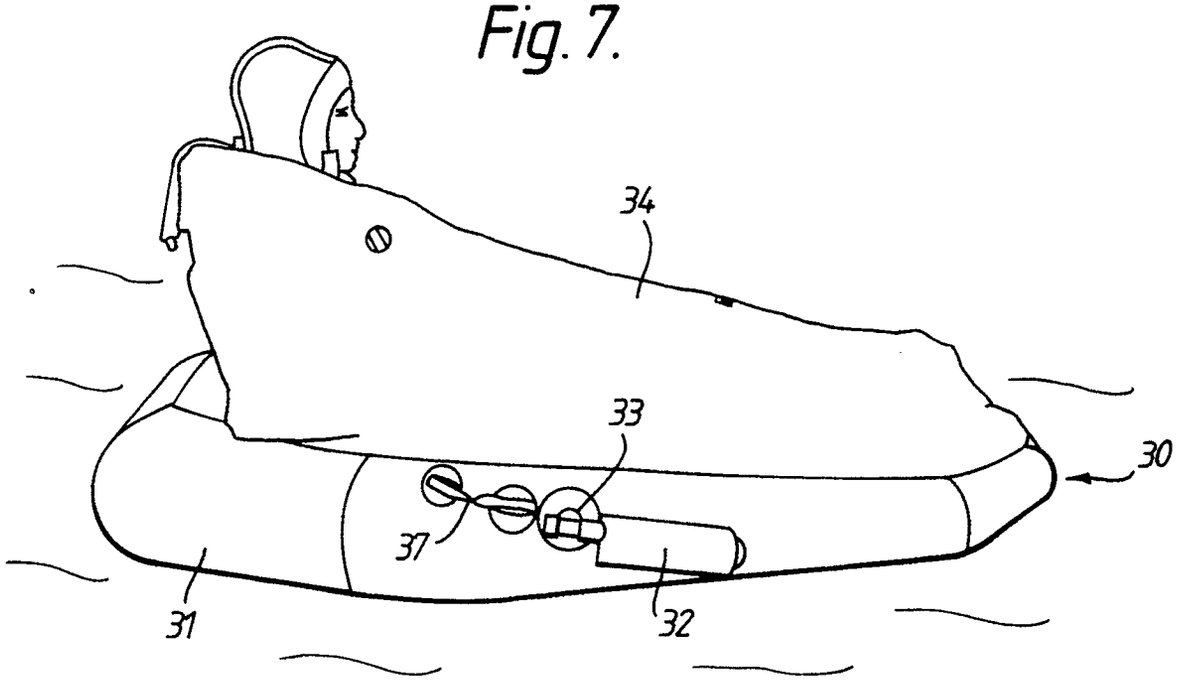


Fig.7.



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EUROPEAN SEARCH REPORT

Application Number

EP 91 10 0191

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	US-A-3 080 586 (STEINKE) * column 2, line 17 - column 5, line 66; figures 1, 2 *	1-5.	B 63 G 8/40
Y,A	FR-A-2 175 358 (AMANJEAN) * page 3, paragraph 2; figure I *	1-5.,8.	
A	GB-A-2 118 498 (AUTOFLUG GMBH) * page 3, lines 16 - 56; figure 1 *	2-5,7-9.	
A	GB-A-7 883 38 (FRANKESTEIN) * page 2, line 70 - page 3, line 4; figures 1-3 *	4-6.	
A	US-A-2 076 219 (BELLONI) * page 2, left-hand column, lines 5 - 9; figures 5, 6 *	1,8.	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 63 G
B 63 C
B 64 D

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	30 May 91	DE SENA Y HERNANDORE

CATEGORY OF CITED DOCUMENTS

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