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(54) Magnetotherapy device

(57) A circular magnet 10 is housed within a cup-shaped ferrous metal shield 16 having a circular base wall 18 in contact with one pole 12 of the magnet and a side wall 20 which substantially surrounds the magnet with a gap 24 between the magnet and the side wall. The gap may be air-filled or substantially filled with a plastics annulus.

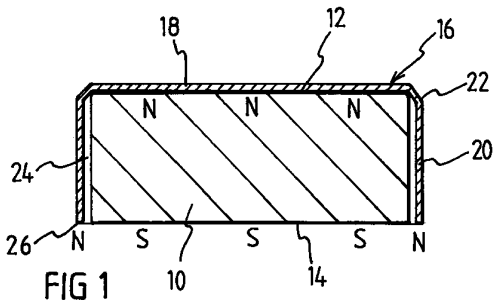

FIG 1

EP 0 898 982 A1

Description

TECHNICAL FIELD OF THE INVENTION

[0001] This invention relates to a device for use in magnotherapy as practised on the human or animal body.

BACKGROUND

[0002] Magnotherapy is a therapeutic process which is sometimes performed by physiotherapists using a pulsed magnetic field to alleviate certain diseases and generally improve the health of the recipient. However, the equipment used is large and extremely expensive and would not be practical for use on a personal basis.

[0003] It is also known to simulate the pulsing of a magnetic field using fixed magnets placed adjacent to the surface of the body so that blood flowing through the body passes through a changing magnetic field. For example, EP 0 744 275-A2 discloses a magnotherapy device comprising a magnet having first and second magnetic poles, the magnet being associated with a flat shield or keeper formed of ferrous material in contact with a second pole of the magnet.

[0004] The present invention seeks to provide a new and inventive form of magnotherapy device.

SUMMARY OF THE INVENTION

[0005] The present invention proposes that the shield includes a side wall which substantially surrounds the magnet with a gap between the magnet and the side wall.

[0006] The width of the gap between the side wall and the magnet is preferably between 0.1 mm and 5mm, preferably less than 2mm. If the gap is small or non-existent the field strength adjacent to the first pole becomes too small, but on the other hand, as the size of the gap increases the flux concentration decreases.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The following description and the accompanying drawings referred to therein are included by way of non-limiting example in order to illustrate how the invention may be put into practice. In the drawings:

Figure 1 is an axial section through a magnotherapy device in accordance with the invention,

Figure 2 is a plan view of the end face of the device,

Figure 3 is a general view of a housing containing a modified form of the device, and

Figure 4 is a transverse section through the device and housing shown in Fig. 3.

DETAILED DESCRIPTION OF THE DRAWINGS

[0008] The magnotherapy device comprises a short cylindrical magnet 10 having opposite north and south poles (N and S) disposed at its flat end faces 12 and 14 respectively. The magnet is housed within a cup-shaped ferrous metal shield 16, which includes a circular base wall 18 surrounded by a cylindrical side wall 20. The shield is formed by a pressing operation which causes a small radius or chamfer 22 to be formed at the junction between the base wall 18 and the side wall 20, but this is exaggerated in the drawing for the purpose of illustration. The outer diameter of the magnet 10 is less than the minimum diameter of the chamfer 22, and the opposed faces of the magnet and base wall 18 are true and flat so that magnetic attraction causes the end face 12 of the magnet to be pulled strongly against the base wall 18 resulting in a self-centring action due to the radius or chamfer 22. As a result, a substantially uniform gap 24 is formed between the magnet 10 and the side wall 20. The size of the gap will normally be between 0.1 mm and 2mm.

[0009] Although the magnet may be held in the shield by an adhesive, even a thin layer of adhesive would introduce a further gap which would reduce the effectiveness of the device. It is therefore preferred to hold the magnet in the shield by magnetic attraction.

[0010] The free end 26 of the side wall 20 is substantially coplanar with the end face 14 of the magnet 10. The lines of magnetic flux from the end face 12 are directed through the shield forming a north magnetic pole which substantially surrounds the exposed south pole face 14. A highly concentrated field strength is thus created in this region.

[0011] As will shortly be described, the device will normally be mounted within a plastic or other non-ferrous housing provided with means for securing the housing to the body of a human or an animal with a contact surface of the housing positioned against the body. The planar end face 14 is either exposed and substantially flush with this contact surface or is separated therefrom by a thin non-ferrous wall. Thus, blood flowing in a direction which is substantially parallel to the contact surface is successively subjected to two changes in the magnetic field, N-S-N. It will be appreciated that such a change in field polarity will occur irrespective of the radial direction in which the blood flows across the face 14, so that the magnet assembly is substantially more effective than known forms of magnet.

[0012] If the magnet is inserted into the shield 20 in an inverted position the poles will be reversed, but the blood will be again be subjected to two changes in the magnetic field, S-N-S, irrespective of the radial direction of flow.

[0013] In Fig. 3 a modified form of the device is contained within a moulded plastics housing 20. The housing comprises a hollow circular part 21 with opposed projections 22 and 23 to which the ends of a wrist band

24 are secured. The wrist band may be of the kind formed of a continuous expandable loop or it may be in two sections which are mutually securable by a clasp or similar device.

[0014] As can be seen in the sectional view of Fig. 4, the hollow part 21 of the housing comprises a shallow container 26 and a closure or back 27. The back 27 includes a round flat wall 28 and a shallow cylindrical wall 29 forming a shallow circular well 30. The outer face of the wall 29 is shaped to snap-engage in the container portion 26, although the two parts of the housing could be secured together by other means, e.g. by an adhesive or by welding. A round magnet 31 having opposite north and south poles disposed at its flat end faces is housed within a cup-shaped ferrous metal shield 32. The shield includes a circular base wall 33 surrounded by a cylindrical side wall 34 and is formed by a pressing operation. The opposed faces of the magnet and base wall 33 are true and flat to form a strong magnetic connection. The free end of the side wall 34 is substantially coplanar with the end face of the magnet 31, and an annular space formed between the magnet and the side wall 34 is substantially filled by a tubular spacer formed by an annulus 35 of polythene or similar non-ferrous plastics material. In this case the size of the gap is about 1mm.

[0015] The magnet 31 and shield 32 are located in the well 30 of back part 27 with the exposed magnetic pole located against the wall 28. Thus, when the back 27 is engaged in to container part 26 the magnet and shield are held securely within the housing.

[0016] The lines of magnetic flux from the end face are directed through the shield forming a magnetic pole which substantially surrounds the exposed opposite pole face, creating a highly concentrated field strength at the periphery of the magnet, which extends through the back 27. Thus when the housing is worn with the back 27 placed against the body, blood flowing in a direction which is substantially parallel to the contact surface is successively subjected to two changes in the magnetic field irrespective of the radial direction in which the blood flows across the face.

[0017] It will be appreciated that the features disclosed herein may be present in any feasible combination. Whilst the above description lays emphasis on those areas which, in combination, are believed to be new, protection is claimed for any inventive combination of the features disclosed herein.

Claims

1. A magnotherapy device comprising a magnet (10, 31) having first and second magnetic poles, the magnet being associated with a shield (16, 32) formed of ferrous material and including a wall in contact with a second pole of said magnet,

   characterised in that said shield includes a side wall (20, 34) which substantially surrounds the magnet with a gap (24, 35) between the magnet and the side wall.

2. A magnotherapy device according to Claim 1, In which the free edge of the side wall is substantially coplanar with the first pole of the magnet.

3. A magnotherapy device according to Claim 1 or 2, In which the gap between the side wall and the magnet is between 0.1mm and 2mm.

4. A magnotherapy device according to any preceding claim, In which the gap is substantially filled with air.

5. A magnotherapy device according to any of Claims 1 to 3, In which the gap is substantially filled with plastics.

6. A magnotherapy device according to any preceding claim, In which the magnet is substantially cylindrical.

7. A magnotherapy device according to any preceding claim, In which the magnet (10, 31) is held in the shield (16, 32) by magnetic attraction.

8. A magnotherapy device according to any preceding claim, In which the magnet and shield are mounted in a non-ferrous housing (20) provided with means (24) for securing the housing onto the body with a contact surface of the housing positioned against the body.

9. A magnotherapy device according to Claim 8, In which the housing comprises two parts:

   - a container (26) to which said fastening means is secured, and
   - a closure (27) for engagement with said container.

10. A magnotherapy device according to Claim 9, In which the closure is formed with a well (30) for receiving and locating said magnet and shield.

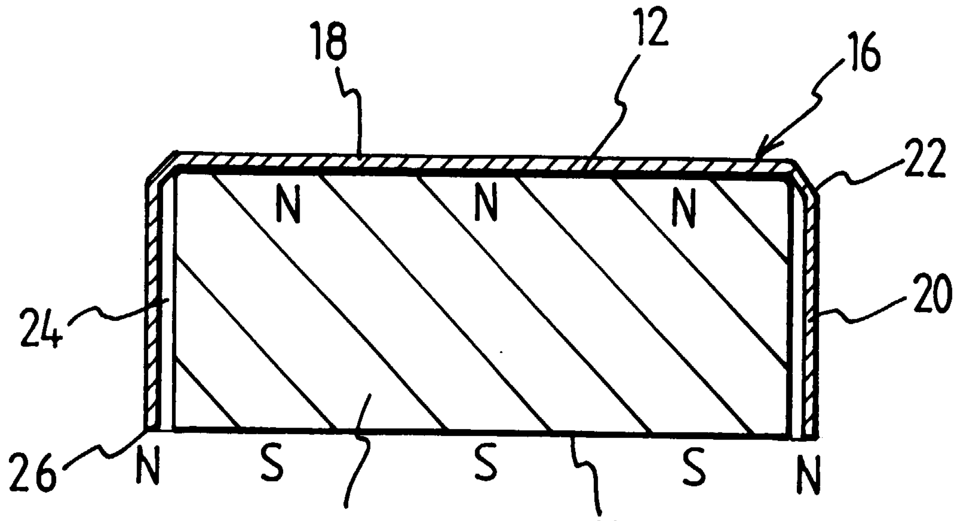
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FIG 1

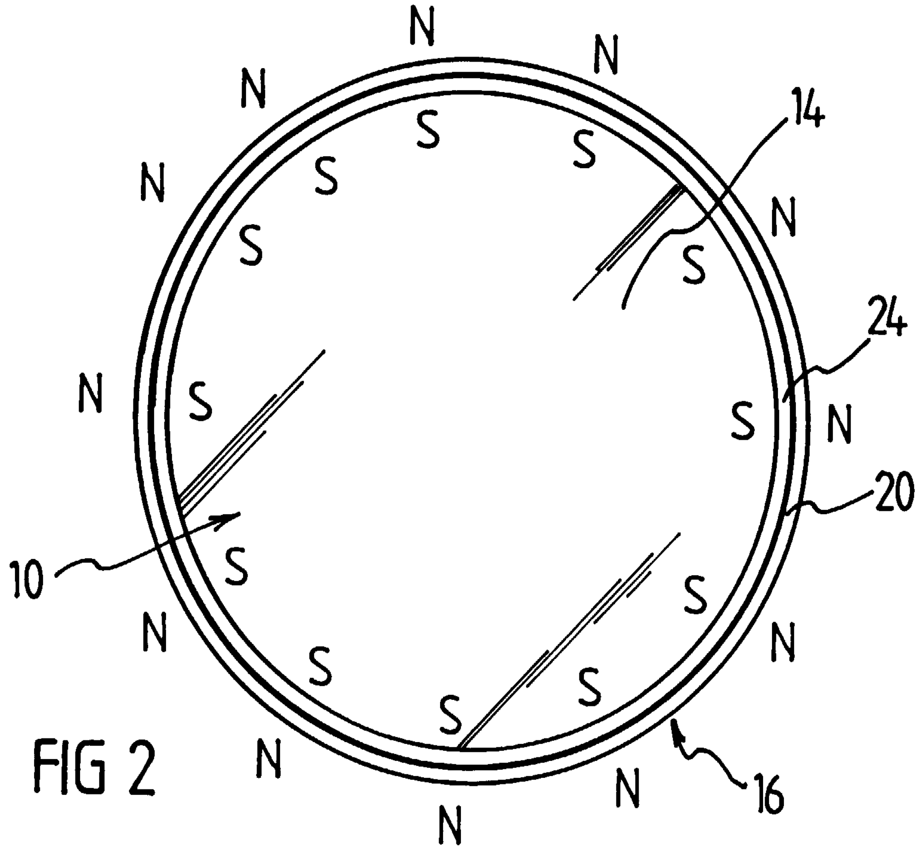
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FIG 2

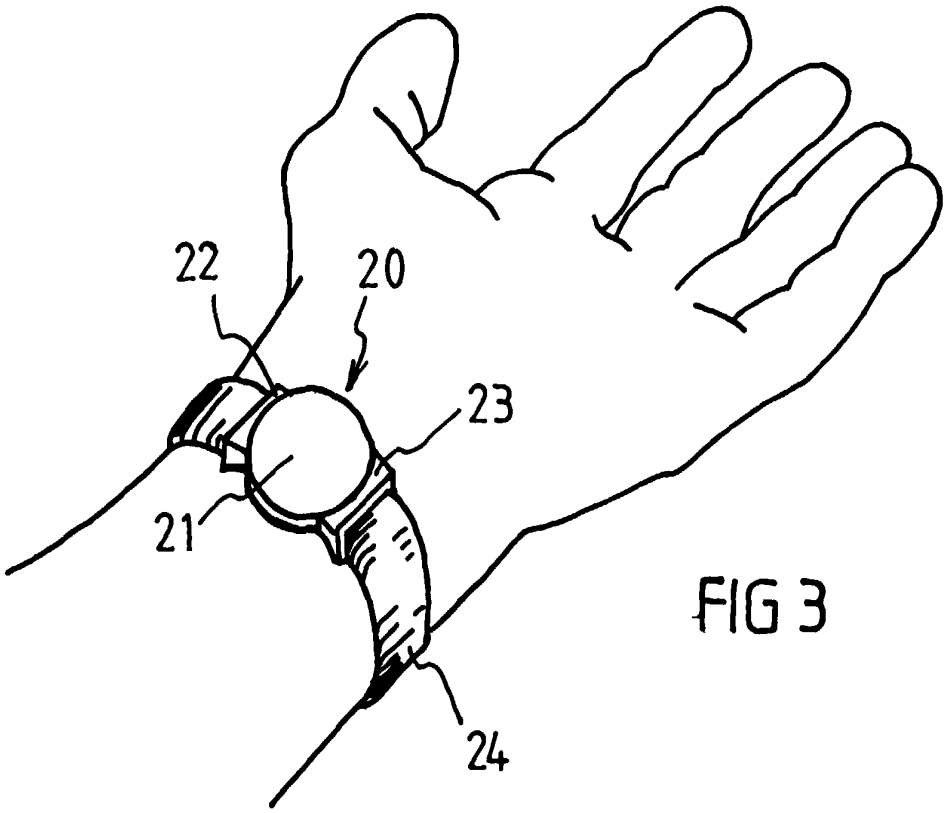

FIG 3

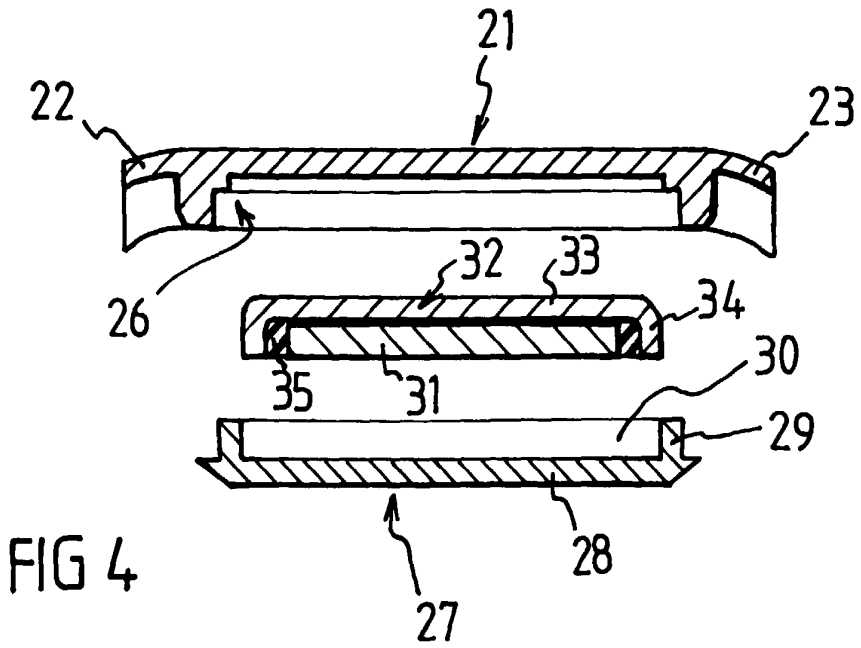

FIG 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5154

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.6)
X	DE 94 13 430 U (FRIEDRICH RAINER) 22 December 1994 * the whole document *	1,2,5-7	A61N2/06
X	WO 82 03177 A (GRANDER JOHANN) 30 September 1982 * the whole document *	1,4,6,7	
A	US 5 226 020 A (LI ZHI L ET AL) 6 July 1993 * column 3, line 24 - column 4, line 5; figures 4,5 *	1,2,6-10	
A	BE 700 056 A (BULLEN E H B) 1 December 1967 * the whole document *	1-8	
D,A	EP 0 774 275 A (ECOFLOW LTD) 21 May 1997 * the whole document *	1,6-10	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A61N

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 December 1998	Petter, E

CATEGORY OF CITED DOCUMENTS

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