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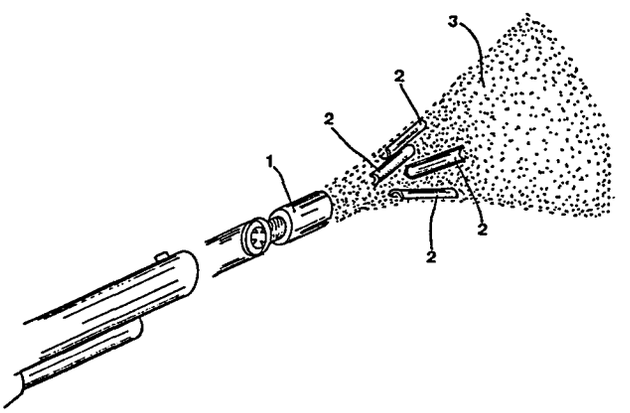
(54) Shotgun cartridge incorporating a scattering-device.

(57) The device disclosed serves to scatter the contents of a shotgun cartridge (5) when discharged at a given target, and is lodged between the wad (4) of the cartridge and its sealed end. The device consists of single strips (2) having a flat, arched, angled or segmented profile when seen in cross section, or alternatively, of slender rods, disposed lengthwise and either glued together of associated via breakable joints such that the force of the cartridge's discharge will bring about their separation, and with it, a widening-out of the spray of shot (3) packed into the case of the cartridge – together with the device – at the moment of its manufacture. Where the device takes the form of a set of strips, these are offset longitudinally so as to occupy the existing space between the wad of the cartridge and its sealed end, and joined together thus.



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Shotgun cartridge incorporating a scattering-device.

The invention relates to a shotgun cartridge for use in field sports and competition shooting - that is, an ammunition cartridge containing loose shot for firearms used in wing-shooting, clay-pigeon-shooting, and small game hunting generally, which projects shot over a wider target area than that normally permitted by the barrel of the shotgun (given identical surrounding conditions) by virtue of its incorporating a scattering-device.

The prior art embraces such scattering-devices incorporated into cartridges for the purpose of enlarging what is basically a circular spray pattern created by the projected shot when spreading out - as uniformly as may be - at a given distance from the muzzle following discharge; this so as to ensure better odds of hitting a moving target (fowl or other game) as it shows suddenly and for a brief instant at short range amidst undergrowth or between the branches of trees, - conditions typical of wooded game reserves.

Such prior art devices include a first type, consisting of a rigid cross-shaped centre-piece of a given length, this centred automatically in the cartridge case and seated on the wad so as to divide the shot into four independent peripheral sectors. A second type has this central cross integral with a one-piece wad-&-sheath in plastic material, the sheath having a predetermined breaking points. A third type has no cross, and as such is suitable for felt wads; this type being used in cartridges with hardened and graphited lead cube pellets. The first type mentioned is not able to invest the shot with the type of force needed to produce a good scatter. The second type, being more compact than the first, produces still less scatter. The third type of device, which is more a contrivance of cartridge design than a device as such, is no more effective than the first two in practical terms, inasmuch as it fails to scatter the projected shot to such an extent as will enable a reasonably proficient marksman to count on picking off fast-moving game at short range, or on notching-up a high percentage of hits in clay-pigeon competition.

The prior art stands thus in need of further improvement with regard to the possibility of producing a notable enlargement of the shot-spray diameter, in order that a participant in game or competition shooting may be provided with the best possible odds - as far as the actual shotgun is able to offer - of picking off game at short range, or of hitting a high percentage of clay-pigeons pulled in competition shooting.

From the foregoing, one may discern the need for a solution to the problem of embodying a device which may be inserted into the case of a cartridge having either the modern one-piece plastic wad-&-sheath or the traditional felt wad, or similar, to the end of producing a notably wider spray of shot than available hitherto with devices and contrivances according to the prior art, assuming a set of identical factors -viz, shotgun bore, barrel-configuration, size and quantity of shot-pellets, type of powder and charge, and other surrounding conditions.

The invention solves the aforesaid problem by adopting an insert for separation of the shot which can be seated on any type of wad, consisting of two or more components fashioned from plastic material, disposed lengthwise in the cartridge, glued together or associated via a breakable joint, which divide the shot into a given number of sectors; the single components of such an insert becoming separated by the force of the shotgun's discharge. Where such components are embodied as strips exhibiting flat, angled, arched, segmented or mixed profile, these are offset longitudinally when located in a single cartridge such that the ends of a given number sit against the wad, whilst the opposite ends of the remainder will be seated either close to, or in direct contact with the sealed end of the cartridge -which may incorporate a disc plug, or simply be cross crimped - such that longitudinal and tangential forces transmitted through the points joining such single strips may drive them apart, bringing about the desired separation. Such strips may exhibit a rectilinear or helicoid longitudinal configuration.

Where components are embodied as simple slender rods - fashion-

ed from wood or plastic, for instance - these are held in position by stellar or annular spreader set flush against the wad in such a way as to shatter once the shotgun discharges.

Advantages offered by the invention are: an enlarged effective spray of projected shot, twice, or three of four times as large, or even more, than that obtainable hitherto in identical conditions with devices and/or contrivances according to the prior art; the option of using a medium-long range shotgun with significantly tapered barrel/s for short range shooting, even in thick undergrowth; a wider spray at 12 to 20 metres than that obtainable at 36 metres using the same shotgun with a conventional cartridge of corresponding type and bore; elimination of the requirement for shotguns having a cylindrical barrel-configuration or for varying degrees of barrel taper, since a single shotgun with a significantly tapered barrel may be used for all-range shooting simply changing the type of cartridge according to the invention, with high odds on hitting the target.

The invention will now be described by way of example, with the aid of drawings in the three sheets attached, in which:
Figure 1 is the longitudinal section through a cartridge as described herein, having a one-piece plastic wad-&-sheath, which illustrates the longitudinal offset of components making up the scattering device;
Figure 2 is a similar section to that in fig 1, though illustrating a cartridge having a felt wad;
Figure 3 is the section through III-III in fig 2, showing the distribution of shot pellets in the cartridge;
Figure 4 is a perspective drawing designed to give a broad idea of how components making up the device are separated following discharge of a cartridge which incorporates the one-piece wad-&-sheath in fig 1;
Figure 5 is the plan, drawn schematically, of a cartridge case with the scattering-device embodied as a pair of flat strips breasted together and offset in the longitudinal plane one with respect to the other;
Figure 6 is a plan as in fig 5 with two flat strips lying

in a common diametral plane, likewise offset in the longitudinal;

Figure 7 is a plan as in fig 5 showing six strips exhibiting an arched profile when seen in cross-section, these arranged around the periphery of the cartridge in a star formation with concave side facing outward, glued together or associated by breakable joints, and offset longitudinally;

Figure 8 is a plan as in fig 5 showing two strips exhibiting an angled profile when seen in cross-section, these located back-to-back with their dihedral angle toward the cartridge case;

Figure 9 is a plan as in fig 5 showing a device with three strips each exhibiting a dihedral angle of 120°, these arranged in star formation with dihedral angle toward the cartridge case;

Figure 10 is a variation on the embodiment in fig 7, showing four strips with a mixed arched-and-stright profile;

Figure 11 is a plan of the device wherein the plastic wad-and-sheath of fig 1 incorporates a cross-shaped centre-piece and is supplemented by four arched strips similar to those illustrated in fig 10;

Figure 12 is a plan as in fig 5 showing four flat strips arranged at right angles one to the next so as to create four peripheral sectors, plus a smaller central space;

Figure 13 shows the same embodiment as fig 12, though with a larger central space;

Figure 14 is a plan as in fig 5 showing four strips exhibiting a symmetrical segmented profile and located back-to-back in star formation;

Figure 15 shows the same embodiment as fig 14, though with a larger central space;

Figure 16 is a plan as in fig 5 showing four angled strips in a simple cross formation, with no central space left to accomodate shot;

Figure 17 is a further variation on the embodiment of fig 15, with a still larger central space;

Figure 18 is the plan, drawn schematically, of a cartridge case with the scattering-device embodied as a set of slender

rods (20 or so in number) interconnected at the wad end by breakable joints;

Figure 19 is a longitudinal section through part of the cartridge as in fig 18, which demonstrates how in this particular embodiment, single components making up the device are of identical length, though not offset lengthwise one from the next, as is the case with components embodied as strips;

Figure 20 is a plan as in fig 5 showing four arched strips disposed with concave side facing inward, glued together or associated by breakable joints so as to form a cylinder;

Figure 21 is a plan as in fig 5 showing four strips with a wide, outward-facing dihedral angle, joined one to the next by their outer longitudinal edges in star formation.

Shot-pellets have not been illustrated in figs 5 to 17 inclusive, for the sake of simplicity.

With reference to the drawings: - 1 denotes a one-piece plastic wad-and-sheath accommodating single components 2 of the scattering device embodied as arched strips, and shot-pellets 3. 4 denotes a felt wad, 5 is the cartridge case. 6 denotes the flat strip type of component which occupies the entire cartridge diameter, whilst two of the flat strip components denoted 7 take up this same diameter.

8 denotes strips exhibiting a 90° dihedral angle, which produce a wider spread of shot packed into these same 90° angles than of that packed into the sectors separating the two strips. 9 denotes further strips exhibiting a dihedral angle. 10 denotes strips with a mixed arched-and-straight profile.

11 denotes a cross-shaped centre-piece integral with the wad-&-sheath - not part of the invention - flanked on all sides by components of the type denoted 2, which in this and other similar instances (viz, fig 7) are either glued together or associated by joints designed to break apart on discharge.

12 and 13 denotes further flat strips (set at right angles one with respect to the other).

14, 15 and 16 are segmented strips, whilst 17 denotes a

further variation on the 90° dihedral strip.

18 denotes slender rod-type or similar tubular, cylindrical or prismatic components of equal length, interconnected at the wad end by breakable joints. 20 denotes cylindrical, or eventually prismatic sectors interconnected by an appropriately shaped spreader which may be either glued, or associated via joints designed to break on discharge of the cartridge.

21 denotes a further variation on the dihedral strip, in this instance connected with adjacent strips via its longitudinal edges.

It will be appreciated that those components joined together by glueing or associated via breakable joints are illustrated (except in figs 18 and 19) with the relevant edges or connected parts simply positioned in close proximity.

Function is as follows: on discharge of the cartridge from the shotgun, the glued or otherwise-joined components making up the scattering device are separated by the impact, and spread apart before dropping to earth some few metres from the muzzle, slightly in advance of the wad. The effect of the components' presence in the cartridge is to spread the shot - especially those pellets packed into the peripheral area of the case, thus widening the spray-pattern projected at the target.

When carrying the invention into effect, materials, dimensions, and details of the design -viz, the profile of components making up the device when seen in cross section, relative positioning thereof, the proportion of shot packed a) into the peripheral area surrounding the device and b) into the central area created thereby, and by definition, the degree of enlargement of projected spray-patterns produced, may all differ from those described and illustrated herein, whilst by no means straying from within the bounds of protection afforded to the invention by claims appended. It is, indeed, a part of the teaching offered by the disclousure, that the cartridge designer may vary the distribution of the packed shot peripherally and internally of the scattering device in order to match the shot spray pattern to a given

target requirement.

CLAIMS

1. Field-sports and competition shotgun cartridge incorporating a shot scattering-device, of the type comprising a one-piece plastic wad-and-sheat (1) with or without cross-shaped centre-piece (11), or a felt wad (4), inserted into the cartridge case (5), characterised in that the device itself consists of two or more single components disposed lengthwise in the cartridge, glued together or associated via breakable joints, located between the wad (1 or 4) and the sealed end of the cartridge case (5), arranged amongst the shot pellets (3), and designed to separate on discharge of the cartridge from the shotgun.

2. Cartridge as in claim 1 characterised in that single components of the device are offset longitudinally one from the next, the protruding ends of the rear-offset components being seated on the wad of the cartridge, whilst the protruding ends of the fore-offset components sit either close to or in direct contact with the sealed end thereof.

3. Cartridge as in claims 1 and 2 characterised in that the device consists of components(2) in the form of strips exhibiting an arched profile when seen in cross section and arranged in star formation with their concave side facing outward.

4. Cartridge as in claims 1 and 2 characterised in that the device consists of two components (6) in the form of flat strips breasted one with the other and occupying the entire diameter of the cartridge.

5. Cartridge as in claims 1 and 2 characterised in that the device consists of two components (7) in the form of flat strips occupying the same diametral plane in the cartridge.

6. Cartridge as in claims 1 and 2 characterised in that the device consists of two components (8) in the form of strips exhibiting a dihedral angle when seen in cross-section, and located back-to-back with said angles facing outward in diametrically opposite directions.

7. Cartridge as in claims 1 and 2 characterised in that the device consists of components (9) in the form of strips exhibiting a dihedral angle when seen in cross-section, and located back-to-back in star formation with said angles facing

outward.

8. Cartridge as in claims 1 and 2 characterised in that the device consists of components (10) in the form of strips exhibiting a mixed profile with arched centre and straight ends, arranged together in star-formation with concave side facing outward.

9. Cartridge as in claims 1 and 2 of the type comprising a one-piece wad-and-sheath with integral cross-shaped centre-piece (11) characterised in that it incorporates a peripherally-located scattering-device consisting of components (2) in the form of strips exhibiting an arched profile and joined together with concave side facing outward.

10. Cartridge as in claims 1 and 2 characterised in that the device consists of components (21) in the form of strips exhibiting a dihedral angle when seen in cross-section, and arranged in star-formation with said angles facing outward.

11. Cartridge as in claims 1 and 2 characterised in that the device consists of four components (12 or 13) in the form of flat strips arranged at right angles one with respect to the other so as to create a central space of square outline, and four peripheral sectors of mixed outline, when viewed in plan.

12. Cartridge as in claims 1 and 2 characterised in that the device consists of three, four or more components (14, 15 or 16) in the form of strips exhibiting a segmented profile when seen in cross section, arranged together in star-formation with concave side facing outward.

13. Cartridge as in claims 1 and 2 characterised in that the device consists of four components (17) exhibiting a 90° dihedral angle when seen in cross section, arranged back-to-back in a simple cross-formation.

14. Cartridge as in claims 1 and 2 characterised in that the device consists of a cylindrical element composed of components (20) exhibiting an arched profile when seen in cross section, or of a prismatic element composed of flat strips.

15. Cartridge as in claim 1 characterised in that the device consists of a bundle of slender rods (18) or similar tubular elements set apart one from the next to allow for packing of the shot (3), and interconnected near to the wad end by a

spreader (19) designed to shatter on discharge of the cartridge.

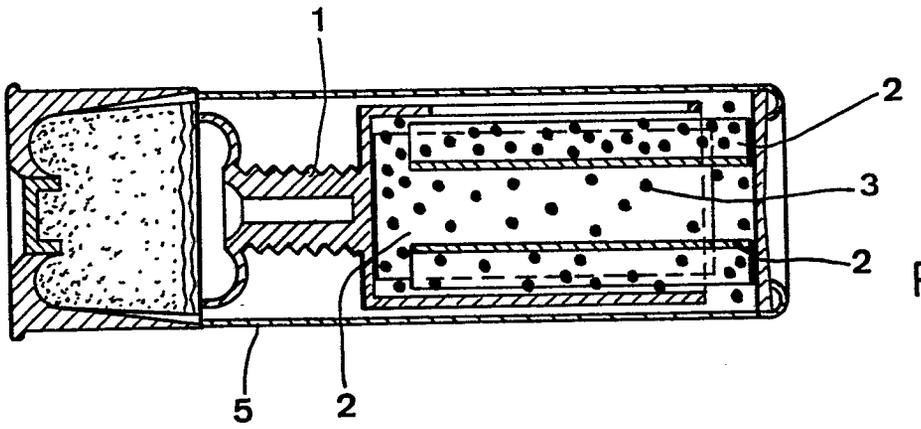


Fig.1

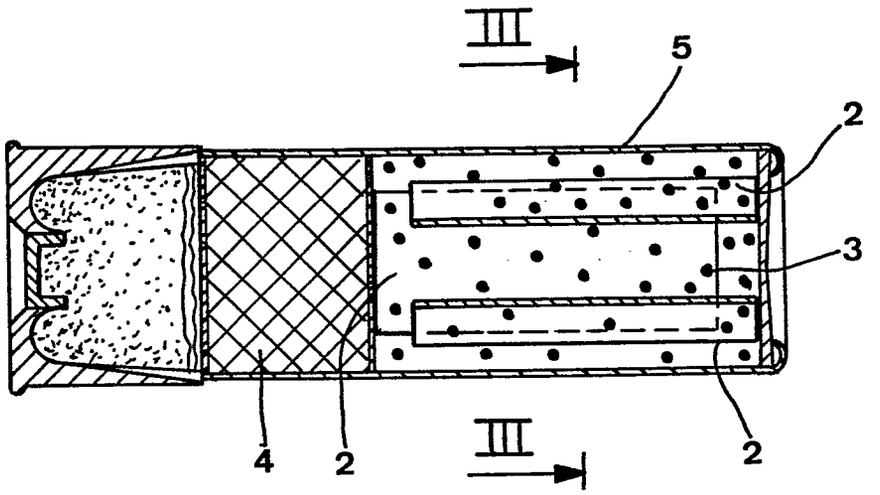


Fig.2

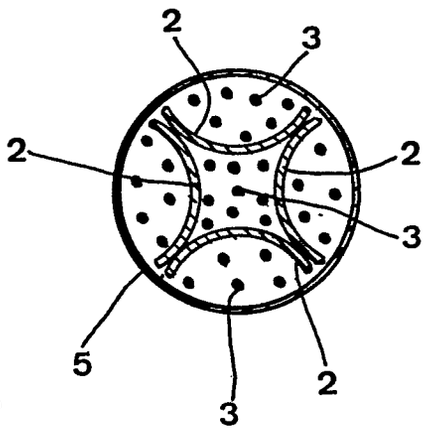


Fig.3

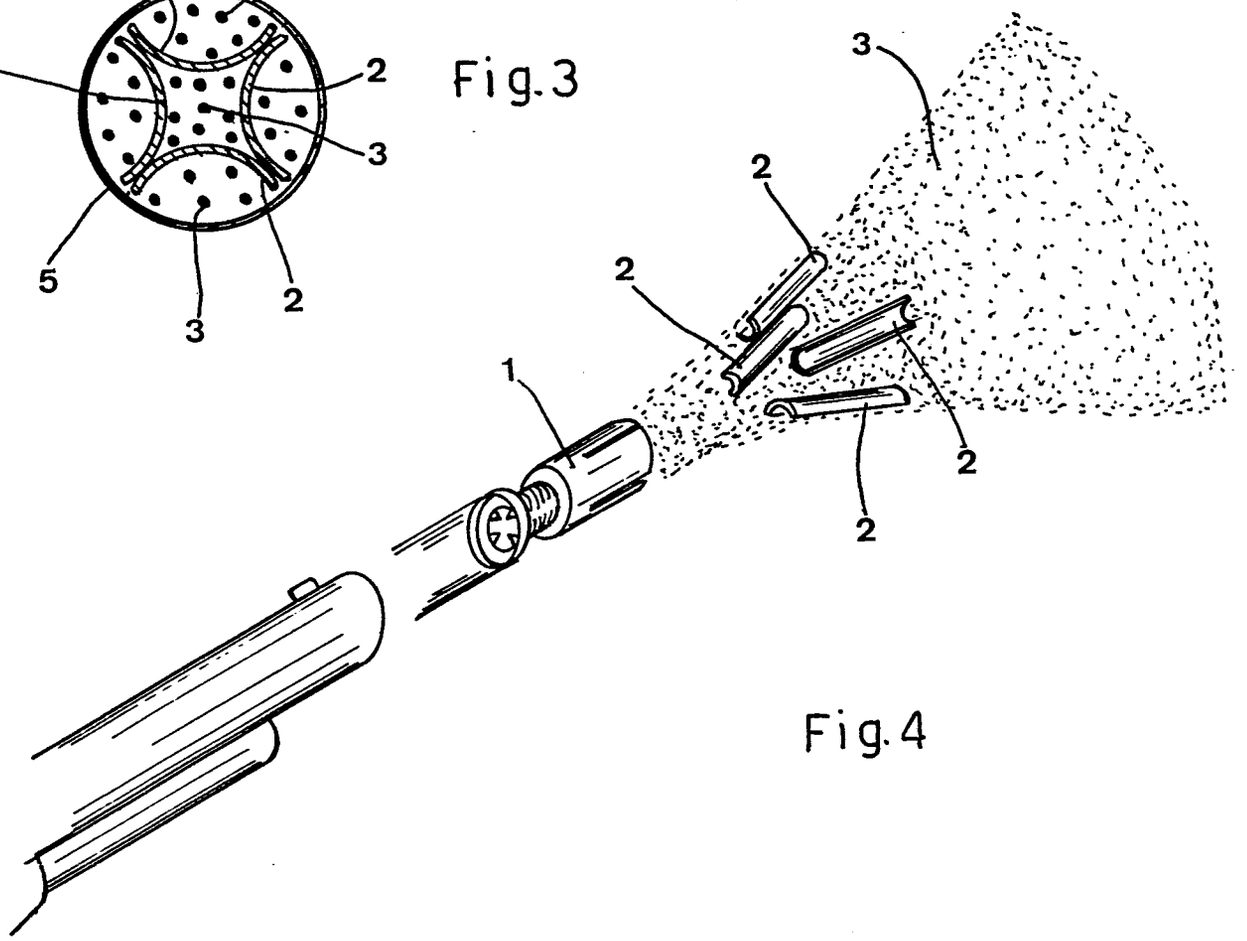


Fig.4

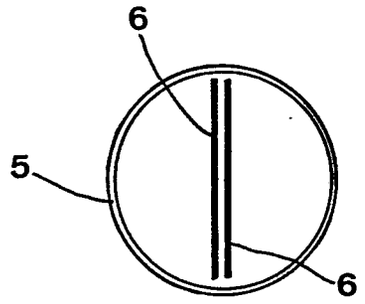


Fig.5

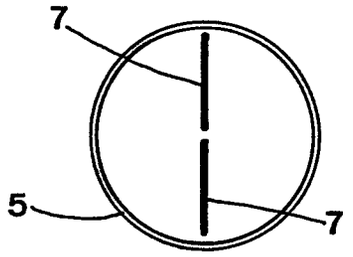


Fig.6

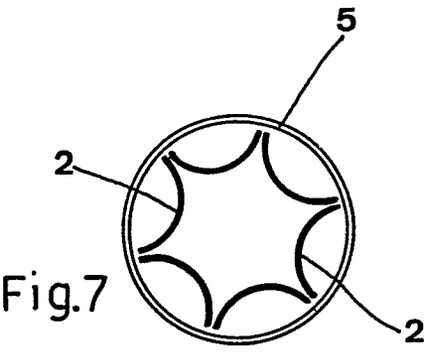


Fig.7

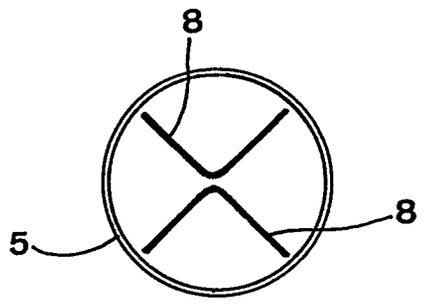


Fig.8

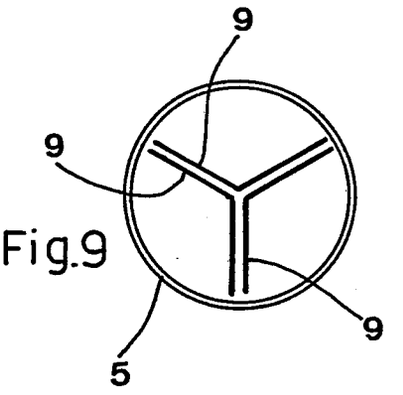


Fig.9

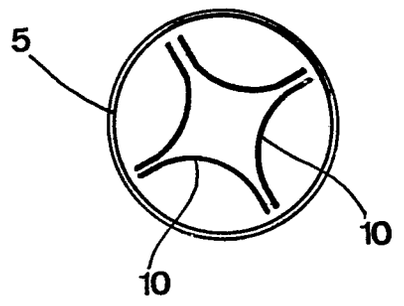


Fig.10

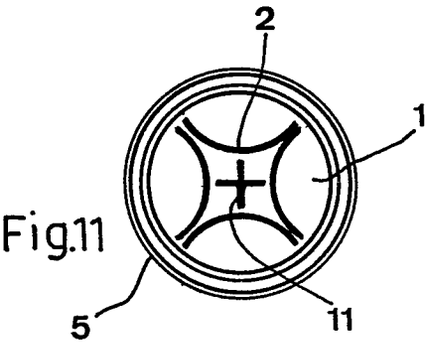


Fig.11

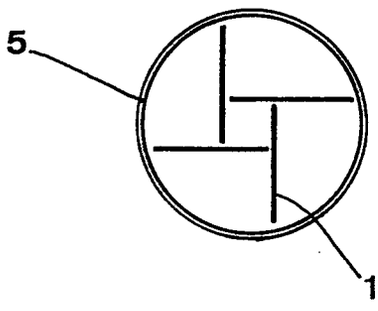


Fig.12

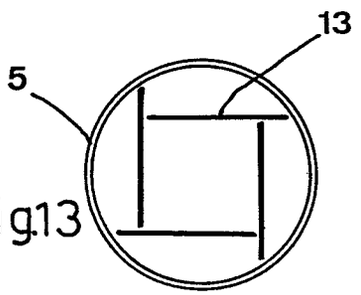


Fig.13

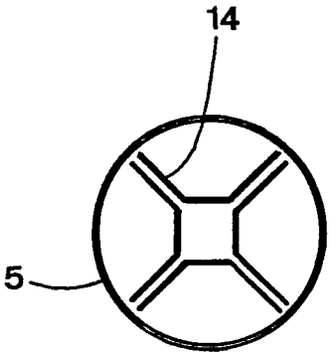


Fig.14

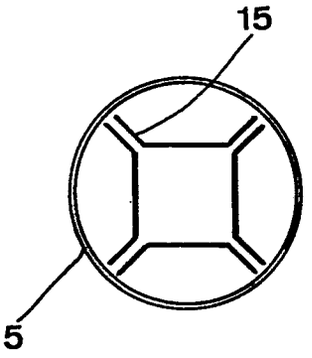


Fig.15

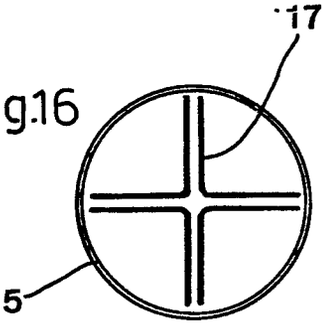


Fig.16

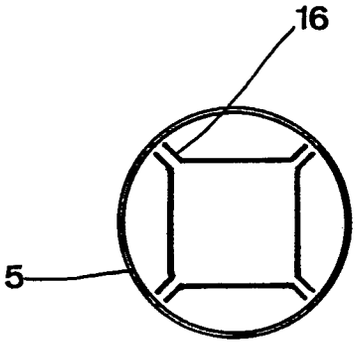


Fig.17

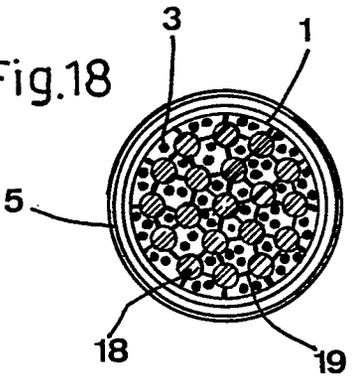
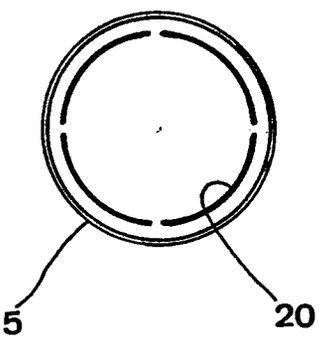


Fig.18

Fig.20



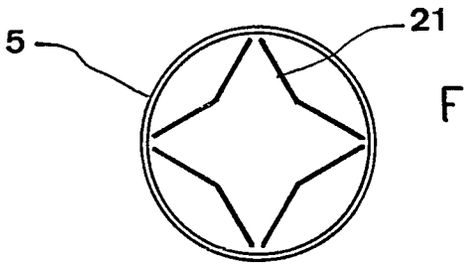
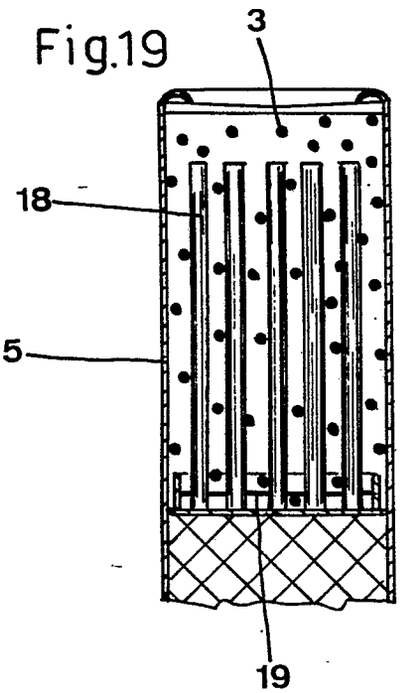


Fig. 21

Fig.19



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EUROPEAN SEARCH REPORT

0159390
Application number

EP 84 11 0096

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.4)
X	FR-A-2 172 572 (LACROIX) * Page 1, lines 14-26; page 2, lines 28-39; page 3, lines 1-7, 26-31; figures 1,2 *	1	F 42 B 7/04
X	FR-A-2 480 426 (MAKI) * Page 8, lines 9-30; page 10, lines 4-36; page 11, lines 1-11; figures 1-15 *	1	
Y		2,5	
Y	FR-A-2 199 861 (REY) * Page 1, lines 39-40; page 2, lines 1-5; page 4, lines 4-21; figures 1-8 *	2,5	
A	FR-A-1 449 850 (PIEGAY) * Page 3, left-hand column, paragraph 4; figures 8-10 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4) F 42 B
A	FR-A- 811 340 (NICOLI) * Whole document *	3,8,9	
A	FR-A-1 596 109 (CARON)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31-10-1984	VAN DER PLAS J.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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