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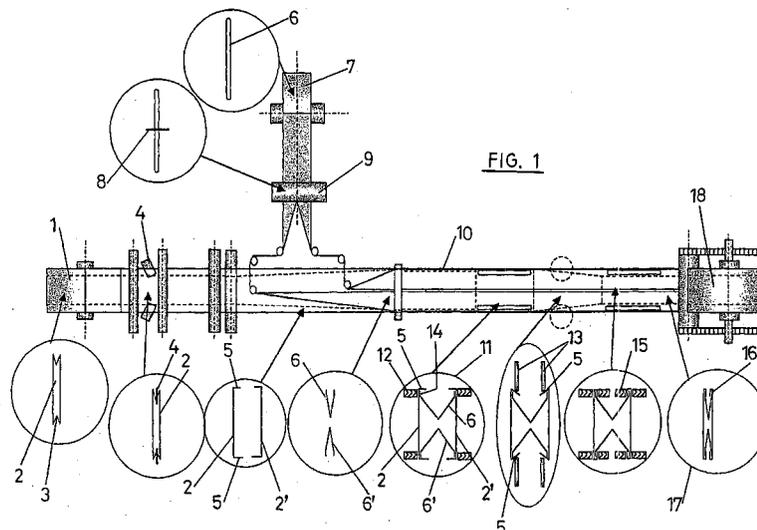
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(54) **METHOD OF OBTAINING A CONTINUOUS MESH TUBE WHICH IS USED TO PRODUCE HIGH-STRENGTH BAGS AND TUBE THUS OBTAINED**

(57) Starting from, for example, a tubular element (2) made of flattened continuous plastic, with a fold or bellows (3), said tubular element (2) is split in half by means of cutting (4) forming two notably equal sheets (2-2') provided with tabs (5) bent inwards. In parallel with this, a tubular element of extruded mesh (6) is also subjected to cutting (8) along its mid plane, determining two half-tubes (6-6') having dihedral configuration and opposing concavities, which are introduced between the

sheets (2-2') such that arranged in the peripheral areas (14) of the former are the proximities of the tabs (5) of the latter, these tabs (5) being then folded inwards and the assembly being subjected to a welding element (15) determining four robust welds (16) in each of which the edge of the extruded mesh is perfectly fixed between two layers of continuous plastic, so that the tubular element obtained, flat and with inner folds, provides a high degree of mechanical resistance against the inner stresses it must endure in a working situation.



**Description****OBJECT OF THE INVENTION**

**[0001]** The present invention refers to a process for obtaining a continuous tubular element of mesh with the participation of extruded mesh, the body being intended for forming bags of great resistance in order to contain within them considerable weights, for example around 15 to 20 kg.

**[0002]** The invention also concerns the continuous tubular element of mesh obtained with said process, which is especially indicated for packaging and transporting mussels or other similar objects which, due to the presence of the cutting edges of their valves, require an extruded mesh of greater thickness in order to prevent rips or tears in the bags.

**BACKGROUND OF THE INVENTION**

**[0003]** The same applicant is the proprietor of Spanish patent of invention with application number 200102600, in which a procedure for obtaining a continuous tubular element of mesh for forming bags for fruit and vegetable products and the like, as well as the continuous tubular element obtained by means of said process, are disclosed.

**[0004]** The solution of this patent, although perfectly valid for packaging products of reduced weight and rounded surfaces, for which the mesh does not require great thickness, leaves a lot to be desired when dealing with heavier products or with products having cutting edges, its drawbacks being centred on the following aspects:

- When using a thicker mesh, the half-tubes obtained when longitudinally sectioning the reticulated tubular element of mesh tend to recover their original shape (excessive rigidity) due to plastic shape memory, which hinders the fold, that is, with the bellows inwards.
- The longitudinal welds between the extruded mesh and the strips of plastic material are simple and therefore weak for supporting heavy weights, with a high probability of tears in the bag at the level of said joining areas between the extruded mesh and the continuous strip.

**DESCRIPTION OF THE INVENTION**

**[0005]** The process proposed by the invention successfully solves the drawbacks set forth above allowing obtaining a tubular element that is capable of receiving considerably greater stresses and without any drawbacks occurring throughout its manufacture despite using thicker meshes.

**[0006]** To this end, and more specifically, the process also uses a band or strip and an extruded mesh as raw

materials. The band may be presented in two different forms: a fold, that is, with a bellows created in the extrusion winding process, or rather from two slightly wider independent sheets, given that the bellows fold is not folded down. These bands could either be printed or not on their outer and inner sides, whereas the folded tubular element can only be printed on their outer side. For its part, the extruded mesh can in turn be a tubular element of mesh, which is cut longitudinally in two half-tubes of equal or similar size, or may rather be two flat sheets of mesh which are folded along their longitudinal axis creating two half-tubes of equal or similar size, using one type or the other according to the hardness of the material, which will be in any case thicker than usual, so that they can resist the greater stresses they must endure.

**[0007]** For the purpose of achieving a tubular element with a section tending towards a rectangle, in which two opposing walls are made of mesh and the other two are completely closed, the process focuses its features on the following aspects:

- The half-tube of extruded mesh are placed with their concavities facing outwards, which means a tendency of the obtained product to be folded with the bellows inwards, further allowing total control of the position of the strips when they enter the packaging machine and facilitating closure of the bag opening, given that it eliminates the classic accompanying plates that form the bellows.
- This inverted position of the half-tubes makes the tubular element have a tendency to close upon itself, due to the polyethylene memory, being easily controllable by means of a rectangular-prismatic wedge coupled inside it.
- Deriving from this new arrangement in half-tube form is the possibility of using two guides fixed to the chassis in comparison to the conventional floating guide, which greatly favours the formation and welding process.
- According to an essential feature of the invention the continuous bands or strips are oversized in width such that they fold upon themselves, enclosing the edges of the extruded mesh strips such that during the subsequent welding three layers of material are achieved in correspondence with the joining lines between the parts, which considerably reinforces the structural resistance of the bag obtained.

**DESCRIPTION OF THE DRAWINGS**

**[0008]** In order to complement the description being made and for the purpose of aiding to better understand the features of the invention, according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description in which, with an illustrative and non-limiting character, the follow-

ing has been shown:

Figure 1 shows the different sequences of the procedure for obtaining a continuous tubular element of mesh for forming bags of great resistance performed according to the object of the present invention, together with the schematic representation of an installation for carrying out the same, which is represented in a plan view.

Figure 2 shows a representation similar to that of the previous figure, but in which said installation is represented in a side view.

### PREFERRED EMBODIMENT OF THE INVENTION

**[0009]** To obtain the closed strip or band, the practical embodiment of Figure 1 starts from a reel (1) of a tubular element (2) provided with a fold, that is with a bellows (3) created in the reeling process, subjecting said flat tubular element (2) in an immediate operating phase, to cutting along the mid plane of its bellows (3) by means of the action of a couple of cutting elements (4), until obtaining two independent sheets (2-2'), each one of them with their edges or marginal areas (5) bent inwards, due to the effect of plastic memory of the material forming said tubular element (2).

**[0010]** In parallel, the extruded mesh, also in the shape of a flattened tubular element (6), is supplied by another reel (7) at the exit of which said flattened tubular element (6) is cut (8) along its mid line with the action of a cutting mechanism (9), defining two half-tubes (6-6') which along their path (10) on the installation will be subjected to a progressive opening by the effect of wedges of variable and increasing angles until the position (11) in which the half-tubes (6-6'), forming angles close to 90° and oriented with their concavities opposite one another, i.e. with said concavities facing outwards, place their openings at the level of the orthogonal bends (5) of the sheets (2-2'), which rest on outer seatings (12).

**[0011]** Immediately after this there are pulleys (13) causing the tabs (5) of the plastic sheets (2-2') to fold inwards, enclosing the peripheral areas (14) of the half-tubes (6), so that the welding elements (15) come immediately into action which, acting on the support dollies (12), define the final welds (16) of the continuous tubular element, which when the aforementioned wedges are removed adopts the flattened position shown in the last sequence (17) of the figures, in order to finally pass towards the winding reel (18) where it remains in conditions for being used as a means for packaging the aforementioned products.

**[0012]** Thus, according to the object of the invention, tubular elements with greater thickness in the materials, and accordingly more resistant, are obtained without this meaning any kind of manufacturing problem for the same, in which their integrating parts (2-6) would be fixed by means of considerably more robust welds (16) in which, specifically the mesh (6) is encased by two lay-

ers of sheet, which also decisively collaborates in an increase in the structural rigidity of the bag or tubular element, capable of withstanding very significant stresses.

### Claims

1. A process for obtaining a continuous tubular element of mesh for forming bags of great resistance, **characterised in that** it comprises:

a) using two continuous closed plastic sheets (2-2') and providing them with bent tabs (5) in correspondence with their edges, or rather using a continuous tubular element (2) of similar features with a fold (3), that is, with a small inner bellows at a mid-level of which a cutting operation (4) is performed in order to transform it into two notably equal parts,

b) incorporating between the two mentioned sheets (2-2') two half-tubes (6-6') of extruded mesh, preferably obtained from a planar tubular element (7) split in two by means of a mid cutting line (8), the half-tubes (6-6') being placed between the sheets (2-2') with their concavities opposite one another, that is, facing outwards,

c) acting on the concavities of said half-tubes (6-6') of mesh with respective wedges of increasing angle, until an extreme situation in which said half-tubes (6-6') adopts a dihedral configuration tending towards a right angle, and in which their peripheral areas corresponding to their openings are placed in adaptation to the inner side of the sheets (2-2') and immediately within the tabs (5) of the latter,

d) folding inwards of said tabs (5) of the sheets (2-2'), towards the inside of the dihedral half-tubes (6-6') with the collaboration of pulleys (13) or other suitable pressure means,

e) fixing by heat-welding elements (15) of the peripheral areas (14) of the half-tubes (6-6') of mesh between the sheets (2-2') and their corresponding bent tabs (5).

f) Removing the wedges and folding the half-tubes (6-6') to a location of maximum proximity between sheets (2-2'), configuring a flattened tubular element wound in reel form (18)

2. A tubular element obtained by means of the process of claim 1, **characterised in that** participating in said process are two continuous plastic sheets (2-2') or bands arranged between which are two mesh parts (6-6') with a dihedral configuration and with their concavities oriented outwards, said sheets (2-2') having their peripheral areas forming tabs (5) which are folded inwards enclosing the peripheral areas (14) of the half-tubes (6-6') of mesh,

establishing in these areas joining welds (16) between the two types of parts (2-6) determining a triple layer, specifically of two outer layers of continuous plastic and an intermediate layer of extruded mesh.

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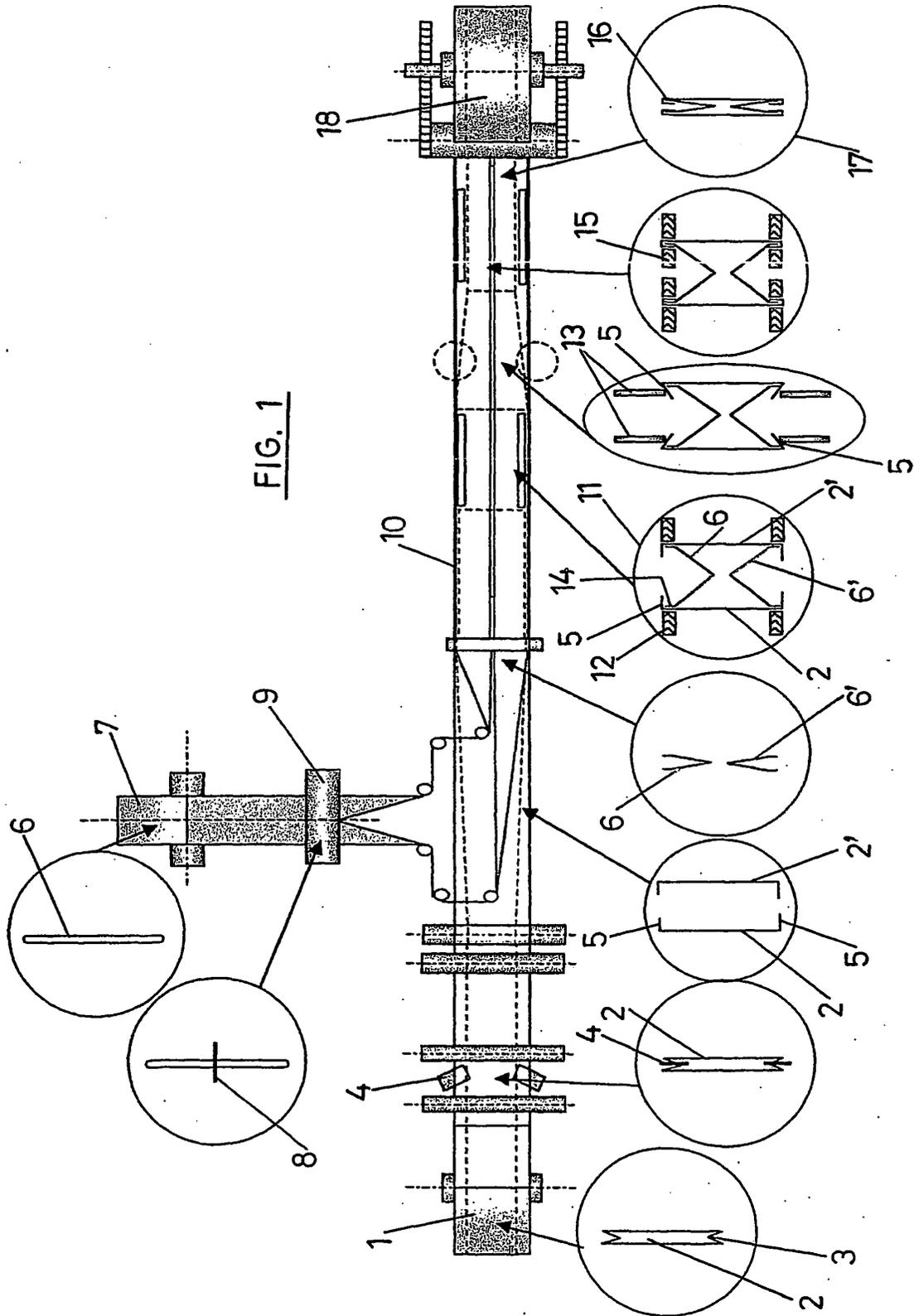
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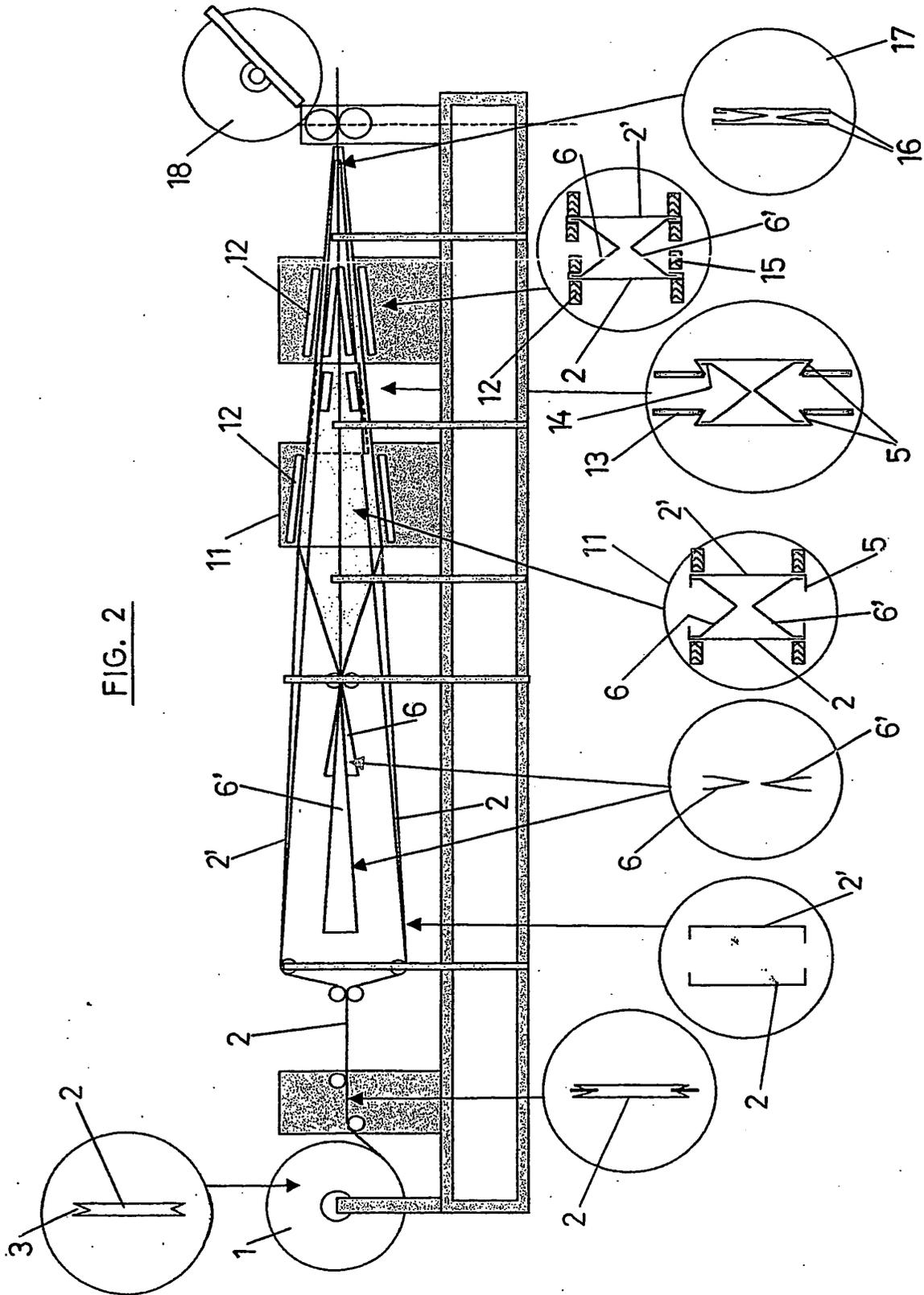
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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ ES 2004/000081

A. CLASSIFICATION OF SUBJECT MATTER		
<b>IPC 7</b> B31B 37/00, B65D 30/06, B65D 33/02		
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)		
<b>IPC 7</b> B31B, B65D		
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 practicable, search terms used)		
CIBEPAT, EPODOC, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	WO 03045803 A1 (INICIATIVAS BARLAR, S.L.) 05.06.2003, <b>the whole document</b>	1, 2
A	WO 02057150 A1 (IP ORGANISERS PTY LTD.) 25.07.2002 <b>page 10, lines 4-22; figures</b>	1, 2
A	ES 1037623 U (CRISTOBAL MESEGUER, S.A.) 16.03.1998 <b>the whole document</b>	1, 2
A	EP 1211061 A1 (ILLINOIS TOOL WORKS INC.) 05.06.2002, <b>the whole document</b>	1, 2
A	ES 2078777 T3 (HAYDN) 16.12.1995, <b>column 8, line 48-column 10, line 29; figures 16-22</b>	1, 2
A	ES 2157785 A1 (PANIAGUA) 16.08.2001, <b>the whole document</b>	1, 2
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 04 MAY 2004 (04.05.2004)		Date of mailing of the international search report 18 MAY 2004 18.05.2004
Name and mailing address of the ISA/ <b>S.P.T.O.</b>		Authorized officer
Facsimile No.		Telephone No.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No  
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