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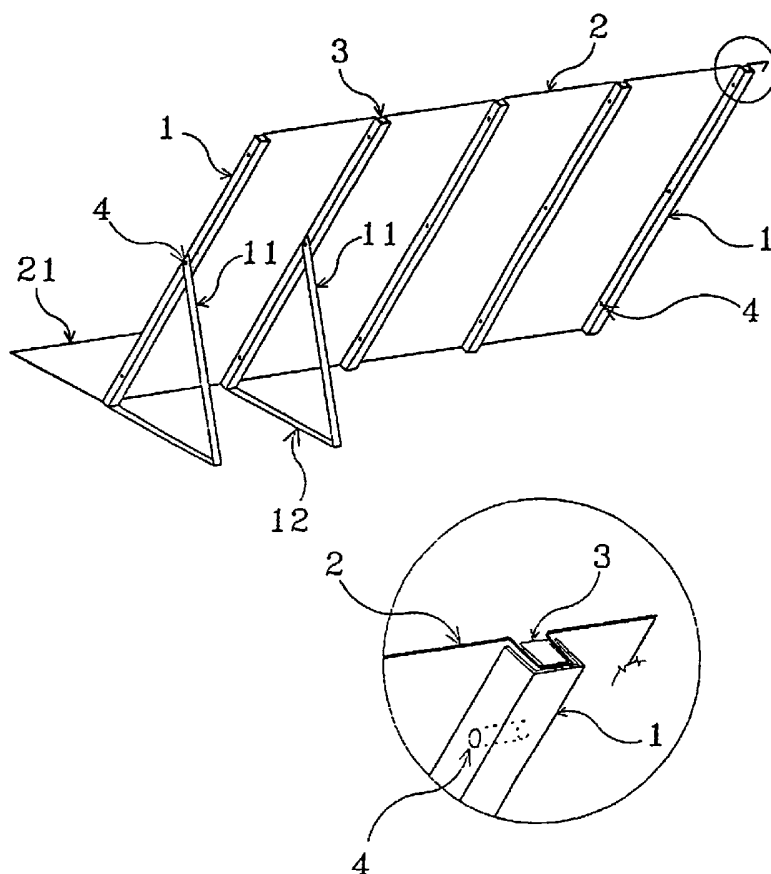
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(54) Title: MOVABLE FLOOD-PROTECTION WALL



(57) Abstract: A mobile wall for flood protection of residential and industrial objects and territories consists of at least two reinforcement beams (1), between which is fastened a water - impermeable foil (2) in such a way that its lower edge (21) overlaps the lower footing of the reinforcement beams (1).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Mobile Wall for Flood Protection

Technical Field

The invention relates to the mobile wall for flood protection, mainly with the purpose of preventing the water penetration into residential and farm buildings and preventing the water to spill out from the water streams to the surrounding environment.

Background Art

The basic flood protection is considered to include the usual water-management system consisting of systems of dams, reservoirs and permanent dikes built in regularly endangered areas, i.e. in the surroundings of water streams. The disadvantage of this type of protection is the fact that – regardless the fact of flood risks to take a few days in the year or to occur once in several years – they must be permanently maintained to be functional if needed.

In extraordinary situations the provisory dikes are built and they usually consist of bags filled with sand, concrete obstacles hardened by sand or mould, various types of prefabricated panels or walls of wood or metal sheet. The disadvantage of such solutions is the fact that they are designed for single-purpose use and it is not possible to transport them to another place or to use them repeatedly. Many people and a lot of material and engineering are needed for production of such barriers and that is another disadvantage of the solution.

Recently, there started to be used mobile flood-control systems consisting of universal segments. These are for example combined stands made of steel – they are of triangular type and covered with euro – palettes covered by impermeable foil. The disadvantage of this solution

is the dependence of the barriers building on supplies and transport of palettes from their owners, as storage of large quantities of long-term unused palettes is uneconomic and requires extensive storage premises.

There are also used so-called stop-log flood prevention systems, consisting of stop-log fields consisting usually of vertical shanks modified for insertion, guiding and fastening of stop-logs created by profiled lamellas of noble materials, e.g. from extruded aluminium or its alloys, mutually inter-filled by sealing elements. The disadvantages of these systems include high purchase costs and necessity of using identical types of stop-logs at the foot of stop-log fields as well as in their upper part regardless the extent of hydrostatic pressure of the water column.

The lamellas from the previous systems can be replaced e.g. according to CZ PAT 288709 by a light-weighted flexible membrane of thin stainless steel sheet. The membrane is fixed to individual shanks by special sealing locks produced also from stainless steel – the advantage in comparison with classic lamella stop-log systems is the fact that within the scope of the whole stop-log field it is necessary to seal only three seams – two of them among the membrane and the shafts and one on the saddleback board of the barrier. The disadvantages of the solution include high purchase costs and quite high weight of the sheet membrane, which makes the assemblage in the field quite difficult.

There is also known the flood-prevention system CZ UV 9627, consisting of a groove that is made in advance in the construction slot on the permanent basis. In case of flood danger, jacketed membrane fields are inserted into the groove and they are mutually sealed by columns. The disadvantage of these systems includes long-term occupation of otherwise unusable areas with created grooves, that must also be covered so as to be protected against pollution or damage.

Disclosure of Invention

The above stated disadvantages of known solutions are to a significant extent eliminated by a mobile wall for flood protection of residential and farm buildings and areas, which is based on the fact that it consists of at least two reinforcement beams – among them there is fastened water-impermeable foil in such a way that its lower edge overlaps the lower footings of the reinforcement beams.

Another characteristics of the solution is the fact that the reinforcement beams consist of longitudinal semi-closed profiles to which is the foil pushed and secured against disengagement, when the foil is advantageously pushed into the inner profile of the reinforcement beam using a flat insert and it is secured there by connection screws, while the walls of the internal profile of the reinforcement bar are equipped with linings.

It is also important that the reinforcement beam is equipped with at least one swinging support, which is advantageously equipped with an adjustment element, fastened among its free end and the footing of the reinforcement beam and it is also equipped with a revolving fixed stabilisation wing in the upper part.

And finally, it is also important that the lower part of the foil is equipped on one or both end with an edge adjusted to the possibility of mutual detachable joint of two neighbouring parts, while the foil is created from detrital technical textiles, that are advantageously created by at least one layer of elastic plastic materials or rubber which is applied on one or both sides to the basic carrying layer.

The technical solution reaches higher and new effects due to the fact that the mobile wall can be used as flood protection element in entrances of residential houses or farm or industrial objects as well as for creation of complex barriers to be placed around whole objects endangered by water floods. Another advantage includes quite low

purchase costs, low demands towards storage and possibility of operative and variable use taking into consideration the height of water column and power of the water stream.

Brief Description of Drawings

Concrete samples of the technical solution are schematically drawn in enclosed drawings, where Fig. 1 shows a view of a part of the mobile wall in axonometric view from the rear, Fig. 2 shows an enlarged detail A of the upper part of the reinforcement beam from Fig. 1 and Fig. 3 is the rear axonometric view of the reinforcement beam with partial fixation of the foil shown in its upper part. Then, Fig. 4 shows a front view of a part of the mobile wall consisting of two connected parts, Fig. 5 is a detail of an alternative solution for the foil fixation in the reinforcement beam, Fig. 6 shows a vertical view of the connecting lock for longitudinal connection of two mobile walls and Fig. 7 shows a sample of fixation of the front part of the foil to the earth.

Detail Description of Drawings

The basic version of the mobile wall consists of at least two reinforcement beams 1, consisted of semi-closed advantageous steel profiles, e.g. in the form of the letter “U”, among which is fastened the water-impermeable foil 2 in such a way that its lower edge 21 overlaps the lower footing of the reinforcement beams 1. Foil 2 is fastened in the reinforcement beams 1 in such a way that it is pushed – using a flat insert 3, e.g. strip material – into the profile of the reinforcement beam 1, where its position is secured by pass-through connecting screws 4 disseminated all along the length of the reinforcement beam 1. So as to avoid damage of the foil 2 when fixing it in the reinforcement beams 1,

it is possible for its inner profile to be equipped with lining 5 on both sides, as shown in Fig. 5.

Then, in compliance with figure 3 it is possible for the reinforcement beam 1 to be equipped – so as to reach stability – with one swinging support 11, with its maximal swing set by the adjustment element 12, e.g. by a strip of plastic or a chain, fastened between the free end of the support 11 and the footing of the reinforcement beam 1. The reinforcement beam 1 can be equipped with a stabilisation wing 13 that is revolving-fixed in its upper part and it is made e.g. of strip material and it secures stability of the reinforcement beam 1 when it is leaned against the house wall or some other surface.

Each mobile wall is equipped with a connecting lock 6, consisted for example of a wide semi-closed profile U for arrangement of the possibility of catching and fastening the edge reinforcement beam 1 of one wall and the free end of the plastic foil 2 of the other wall, as shown in Fig. 6 The bottom part of the foil 2 can be equipped from one or both sides with an edge 22 adjusted to the possibility of mutual detachable joint of neighbouring parts, e.g. equipped with a velcro connection 23 as shown in Fig. 4.

When creating the flood protection, the foil 2 is fixed in regular intervals to the reinforcement beams 1 and so there are created the basic elements for the mobile wall. The segments are placed and fixed individually in front of entries of buildings or they are connected using connecting locks 6 and in this way there are created long complex walls surrounding the whole object in danger. The lower edge 21 of the foil overlapping the footings of the reinforcement beams 1 is fixed to the earth – e.g. pushed by a rubber chock 7 in a longitudinal groove 8 developed in advance as shown in Fig. 7.

The above described sample of the mobile wall is not the only possible construction according to the technical solution, but the reinforcement beam 1 can be made of different profile material and it is

not necessary to equip it with the support 11 or the adjustment element 12 or the stabilisation wing 13. Similarly, the plastic foil 2 at mobile walls for securing the entries to objects does not have to be equipped with the edge 22, unless it is expected to be connected to create large units.

Industrial Applicability

The mobile wall according to the technical solution can be used for arrangement of flood protection for objects or areas endangered by occasional flooding or watering, if it is not efficient to develop permanent barriers.

Claims

1. A mobile wall for flood protection of residential and industrial objects and territories, characterised by the fact that it consists of at least two reinforcement beams (1), between which is fastened a water – impermeable foil (2) in such a way that its lower edge (21) overlaps the lower footing of the reinforcement beams (1).
2. A mobile wall according to claim 1 characterised by the fact that the reinforcement beam (1) consists of longitudinal semi-closed profiles to which is pushed the foil (2) and secured against disconnection.
3. A mobile wall according to claim 1 characterised by the fact that the foil (2) is pushed to the inner profile of the reinforcement beam (1) using a flat insert (3) and it is secured there using connecting screws (4).
4. A mobile wall according to claim 3 characterised by the fact that the inner profile walls of the reinforcement beam (1) are equipped with lining (5).
5. A mobile wall according to claim 1 characterised by the fact that the reinforcement beam (1) is equipped with at least one swinging support (11).
6. A mobile wall according to claim 4 characterised by the fact that the support (11) is equipped with an adjustment element (12) fixed between its free end and the footing of the reinforcement beam (1).
7. A mobile wall according to claim 1 characterised by the fact that the reinforcement beam (1) is equipped in its upper part with a revolving fixed stabilisation wing (13).

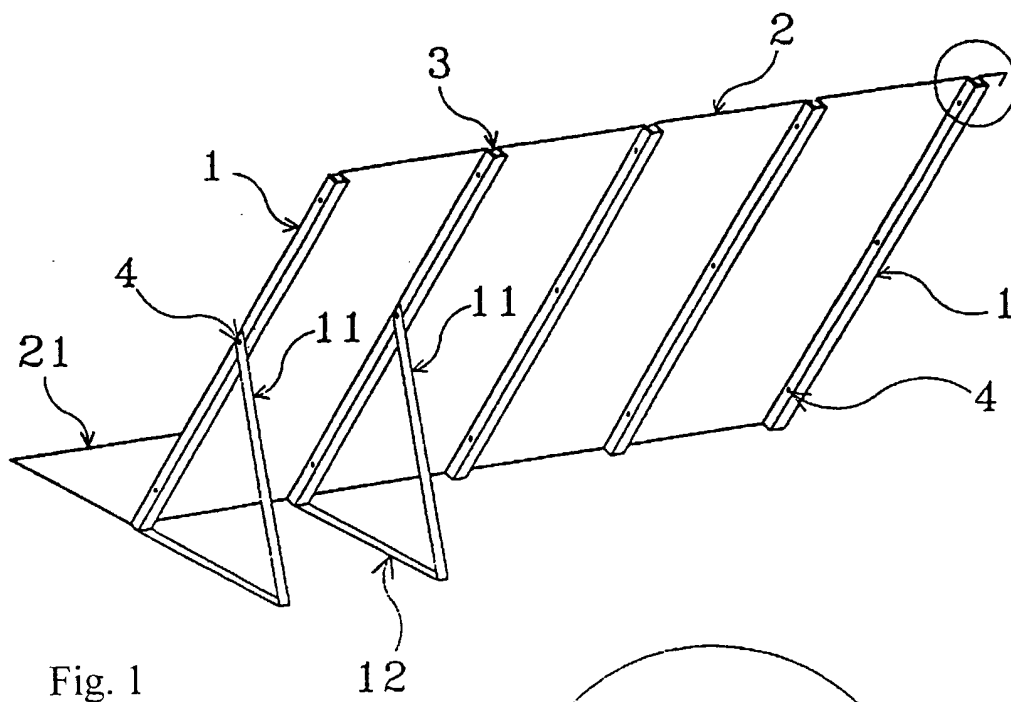


Fig. 2

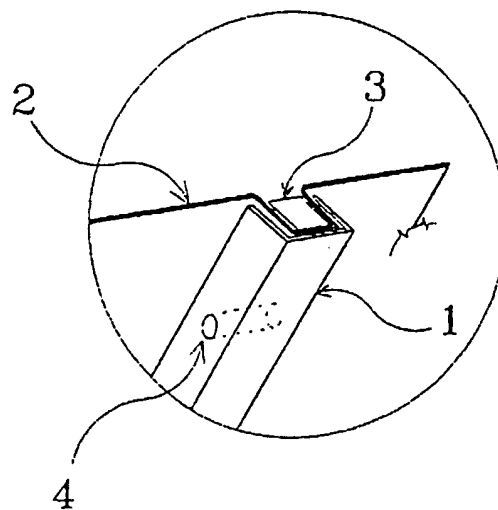
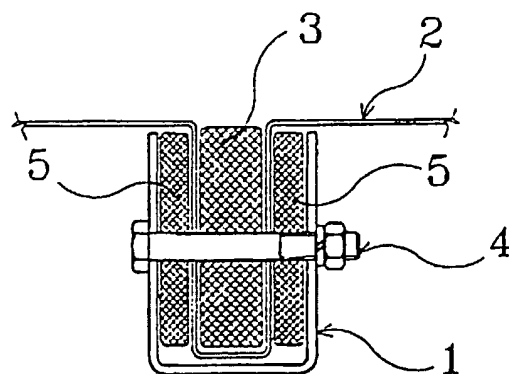
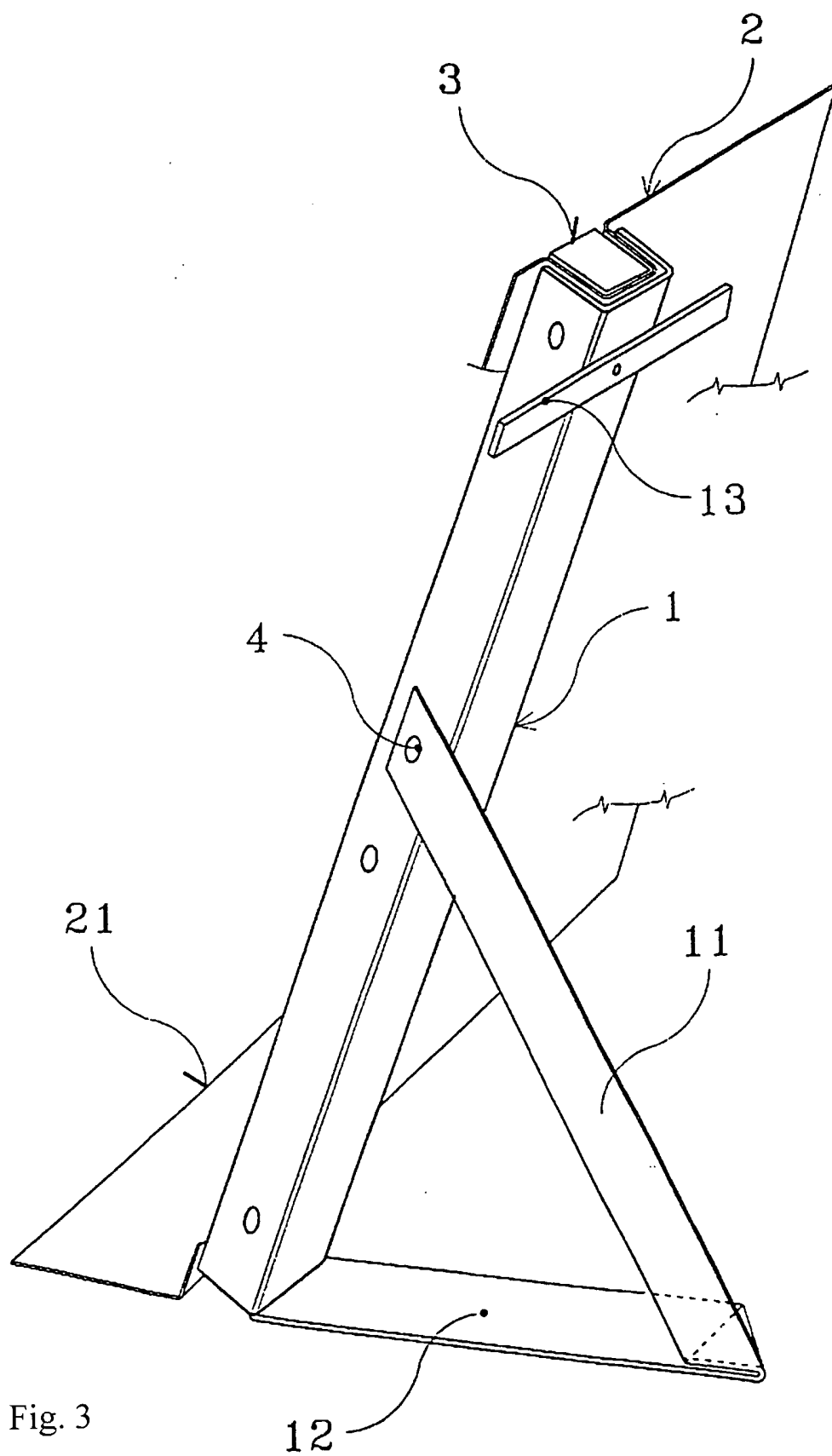


Fig. 5





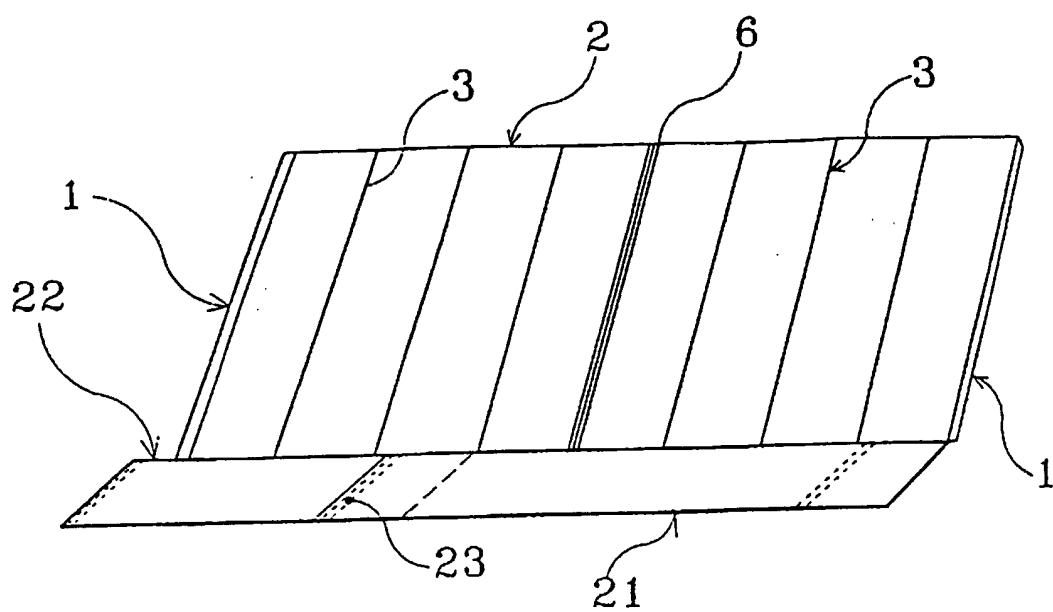


Fig. 4

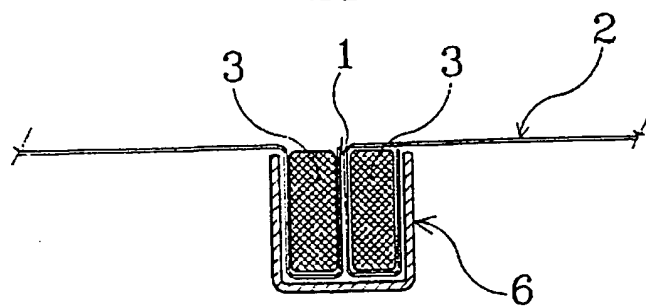


Fig. 6

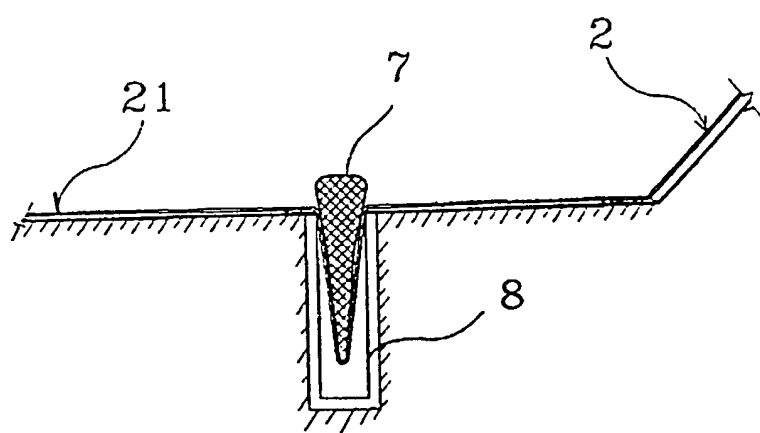


Fig. 7

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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)

IPC 7 E02B

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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