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EUROPEAN PATENT APPLICATION

21 Application number: **86116487.9**

51 Int. Cl.⁴: **A47L 11/10**

22 Date of filing: **27.11.86**

30 Priority: **24.02.86 US 832485**

43 Date of publication of application:
30.09.87 Bulletin 87/40

64 Designated Contracting States:
DE GB IT

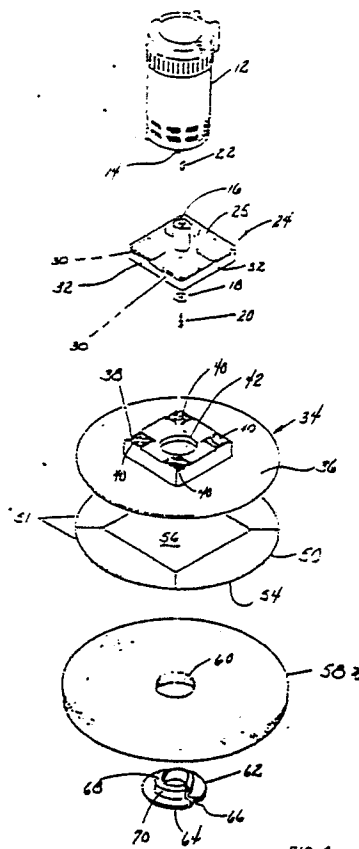
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54 **Floor maintenance device drive system.**

57 A floor maintenance device includes a drive system with a driver member (24) mechanically engaged with a pad holder. The pad holder (34) is temporarily attached to the driver member during assembly by the use of pressure sensitive contact pads (30, 40). The pad holder is also mechanically attached to the rotating pad during assembly by a similar pressure sensitive contact attachment system. Through the use of pressure sensitive contact pads the concentricity of the various parts is maintained during assembly and the chance for vibration is substantially diminished.



Figs. 1

FLOOR MAINTENANCE DEVICE DRIVE SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to a floor maintenance device, more particularly, a floor maintenance device including a rotating pad for contact with a floor surface.

The floor maintenance device of the type described by the present invention includes a driver system and a rotating pad. The pad may be used for polishing the floor surface to give a shiny or glossy appearance. In recent years, the use of high speed buffers or burnishers has become accepted due to the ability of these high speed machines to give floors a very high sheen or gloss. While the high rotary speed of the pad provides the desired sheen or gloss to the floor, it also results in the need for more frequent replacement of buffer or scrubber pads on the bottom of the floor maintenance device. Additionally, if the pad is not placed properly with respect to the driver, vibrations may be transmitted to the operator, which, if severe, may render the buffer unusable. Replacement of pads in high speed buffers is difficult because the pad is typically attached to the bottom of the driver by mechanical fasteners. Such a rigid attachment means is used in an effort to reduce vibration. Each time a pad becomes dirty or worn out, the mechanical fasteners must be removed and attachment means reassembled in order to replace the pad. If not done carefully, vibrations will result which require disassembly and remounting of the pad. There is therefore a need in the art to provide a floor maintenance device which provides a high speed pad driving system adapted for quick replacement of floor maintenance pads and which will also mount the pad so that vibrations will be kept to a minimum.

SUMMARY OF THE INVENTION

A floor maintenance device includes a drive system which rotates a pad against a floor. The drive system includes a driver member which has several pressure sensitive contact pads affixed to its underside. The driver member is in contact with a pad holder having outwardly extending flange and a central portion. The central portion of the pad holder fits within the driver member and is maintained in contact therewith by compatible pressure sensitive contact pads which are affixed to the topside of the pad holder. On the underside of the pad holder are additional pressure sensitive contact pads which hold the rotating floor pad in place.

Once the pad, the pad holder and driver member have been aligned by use of the pressure sensitive contact pads, a retainer which extends through the center of the floor pad and the pad holder is used to mechanically mount the pad to the driver member.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the floor maintenance device and drive system therefor of the present invention may be had by reference to the drawings wherein;

Figure 1 is an exploded view of a drive system for a floor maintenance device;

Figure 2 is a side elevational view partially in section of the driver member as shown in Figure 1;

Figure 3 is an end view of the pad holder;

and Figure 4 is a side view of the pad gripper face.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The floor maintenance device of the present invention includes a drive system for a rotating pad which has three essential components. These three components are a driver member which is connected to a rotary driver such as an electric motor, gas engine, air motor or hydraulic motor; a pad holder which is attached to the driver member both transmit rotating force to the pad and also holds the floor maintenance pad in position and thirdly; a rotating pad grip face and retainer which mechanically mounts the rotating pad to the driver member. A better understanding of the inter-relationship of these three parts may be had by reference to Figure 1 wherein motor 12 is shown above driver member 24. As previously mentioned, motor 12 may be an electric motor, a gas engine, or a hydraulic or air motor. Additionally, other types of power systems which impart rotating power to a shaft may be used. Motor 12 imparts rotating power to shaft 14 which fits within shaft receptacle 16. To assure a tight fit between shaft 14 and shaft receptacle 16 a key 22 may be used and additionally a washer 18 and bolt 20 may also be used to attach driver member 24 to shaft 14.

As shown in Figures 1 and 2 driver member 24 in the preferred embodiment is a generally square or box shaped device consisting of a plate 25 which has four depending sides 32. Plate 25 has a

top 26 and an underside 28. On the underside 28 of the plate 25 are mounted four pads 30. While four pads 30 are shown in the preferred embodiment, it will be understood that a continuous pad or any number of pads may be used in place of the four pads designated by reference numeral 30.

A comparison of Figure 2 to Figure 1 shows the four pads 30 in their position on the underside 28 of driver member 24. Additionally, Figure 2 illustrates groove 29 whose function will be explained later in conjunction with the use of retainer 62.

Pads 30 are of the type which are commonly known as VELCRO® fasteners. Such VELCRO® fasteners may be more generically termed hook and loop pressure contact attachment systems. Pads 30 may either be of the hook variety or of the loop variety. Corresponding pressure sensitive pads 40 to pads 30 are located on pad holder 34 whose construction and function will now be explained.

As best shown by Figures 1 and 3 pad holder 34 consists of an outwardly extending flange 36 and a central portion 38. The central portion 38 is constructed so as to fit within driver member 24. While a square or rectangular arrangement is shown in the preferred embodiment it will be understood that the key function of the meeting of driver member 24 and central portion 38 of pad holder 34 is to transmit drive forces to pad holder 34. Any shape which may accomplish this function is suitable. Accordingly, a polygon shape may be used in place of the square shape shown in the preferred embodiment.

The central portion 38 of pad holder 34 includes an aperture 42 in its midst. Also included on central portion 38 of pad holder 34 are pads 40. These pads 40 correspond in position to pads 30 of driver member 24. When central portion 38 of pad holder 34 is inserted into driver member 24, pads 40 engage pads 30. Because of the hook and loop pressure contact system which characterize pads 30 and 40 in the preferred embodiment, a mechanical attachment between pads 30 and 40 will take place. While it is understood that pads 30 and 40 are shown as VELCRO® pads in the preferred embodiment, any type of pressure sensitive contact pads may be used in place of the VELCRO® fasteners. Specifically, pressure sensitive glued pads or magnetic pads are examples of pads which may be substituted for the VELCRO® pads shown in the preferred embodiment.

Additional details of construction of pad holder 34 are shown in Figure 2. Specifically, on the bottom 48 of pad holder 34, are additional VELCRO® or hook and loop type fasteners. This fastener system is designed to engage pad grip face 50 (Figure 1). While pad grip face 50 is shown as

consisting of four segments 51 in the preferred embodiment, it will be understood that pad grip face 50 may be constructed of any number of segments.

Further details of the construction of pad grip face 50 may be had by reference to Figure 3 wherein it is shown that the underside or bottom 54 of pad grip face 50 is characterized by a similar type of hook and loop type fasteners as used on the bottom 48 of pad holder 34.

As may be further seen in Figure 1, pad 58 is in contact with the underside 54 of pad grip face 50. Because of the fibrous or rigid foam nature of pad 58 the hook and loop contact attachment system 55 on the bottom of pad grip face 50 will mechanically engage pad 58.

Retainer 62 fits within hole 60 of pad 58 and passes through hole 60 of pad 58, hole 56 and pad grip face 50, aperture 42 in pad holder 34 and eventually mounts in groove 29 (Figure 2) of driver member 24. Accordingly, central portion 70 of retainer 62 is of sufficient length to mount pad 58 to driver member 24. This mounting is accomplished by engagement of retaining ring 68 in groove 29. Pad 58 is held in place by the force of flange 64 against the underside of pad 58.

OPERATION

When it is desired to remove or replace pad 58 because of excessive wear or dirt formed on the underside of pad 58, retainer 62 is removed. This is accomplished by compressing the size of retainer 62 utilizing split 66 in retainer 62 to reduce the circumference of retainer 62. Accordingly, retaining ring 68 may then be removed from groove 29 in driver member 24. With the removal of retainer 62, it is now possible to remove pad 58 and pad holder 34. The use of pressure sensitive contact pads 40 and 30 simplifies this operation as it is then merely necessary to peel pads 40 away from pads 30.

After the combination of pad 58, pad grip face 50 and pad holder 34 are removed from driver member 24 it is then possible to disassemble pad 58 from pad holder 34. This is easily accomplished by the peeling away of pad 58 from pad grip face 50. A new pad 58 may then be replaced on pad grip face 50 and the device reassembled.

It is upon reassembly that the benefit of the VELCRO® fasteners to reducing vibration becomes most apparent. The VELCRO® fasteners allow pad 58 to be placed concentrically on pad grip face 50 and pad holder 34. Once this has been accomplished, the final step involves the insertion of retainer 62 through hole 60 in pad 58, hole 56 in pad grip face 50, aperture 42 in pad holder 34 and

engagement of retaining ring within groove 24 of driver member 24. The use of VELCRO® fasteners prevents misalignment or lack of concentricity of the rotating parts during reassembly.

There is thereby provided by the floor maintenance device of the present invention, a system for providing rotating force to a floor maintenance pad which may be easily disassembled and reassembled without inducing significant vibrations to the user.

The driver member of the present invention may be manufactured from steel, aluminum or any rigid material which will withstand rotating drive forces commonly associated with floor maintenance devices. As previously stated, pads 30 may be made from VELCRO®, glue or magnets. Pad holder 34 may be constructed of metal, plastic or any rigid material which has some flexibility but will withstand the drive forces and high speeds normally associated with a floor polisher or burnisher. As previously stated, pads 40 may also be VELCRO® or any other convenient type of pressure sensitive contact system which will provide the peelable contact necessary for rapid disassembly and reassembly. Pad grip face 50 may be constructed of any suitable material which will allow the attachment by hook and loop means. Retainer 62 may be made of any suitable plastic or metallic material which will provide sufficient compressive forces to hold pad 58 in place and retain its shape after compression at split 66 so as to hold pad 58 in place when mated with groove 29 in driver member 24.

It is to be understood that while the floor maintenance device of the present invention has been described in accordance with the preferred embodiment, the scope of the present invention is to be determined only by a reading of the claims by one of ordinary skill in the art giving reference to the specification and figures.

Claims

1. A floor maintenance device comprising:
a floor pad or the like;
means for rotating said floor pad or the like;
a driver member constructed and arranged to driveably engage said means for rotating said floor plan or the like;
at least one pressure sensitive contact pad affixed to the underside of said driver member; and
a pad holder, said pad holder having:
an outwardly extending flange;
a central portion constructed and arranged to driveably engage said driver member;
at least one pressure sensitive contact pad affixed to the topside of said central portion for engage-

ment with said pressure sensitive pad affixed to the underside of said driver member; and
means for driveably and removably mounting a floor pad or the like located on the underside of said outwardly extending flange;
whereby the floor pad may be driven in a rotary fashion and easily replaced.

2. The floor maintenance device as defined in Claim 1 wherein said pressure sensitive contact pads utilize a hook and loop attachment system.

3. The floor maintenance device as defined in Claim 2 wherein the driver member and said central portion of said pad holder are polygons.

4. The floor maintenance device as defined in Claim 3 wherein said central portion of said pad holder fits within said driver member.

5. The floor maintenance device as defined in Claim 4 wherein said means for driveably and removably mounting a floor pad includes a hook and loop surface contact arrangement.

6. The floor maintenance device as defined in Claim 5 wherein said means for driveably and removably mounting a floor pad includes means for mechanically and removably mounting said floor pad to said driver member.

7. The floor maintenance device as defined in Claim 1 wherein said means for driveably and removably mounting a floor pad includes a hook and loop contact arrangement.

8. The floor maintenance device as defined in Claim 7 wherein said means for driveably and removably mounting a floor pad includes means for mechanically and removably mounting said floor pad to said driver member.

9. A drive system for rotating a floor pad or the like comprising:

a shaft;

means for rotating said shaft;

a driver member constructed and arranged to rotate with said shaft;

at least one pressure sensitive contact pad affixed to the underside of said driver member; and

a pad holder, said pad holder having:
an outwardly extending flange;

a central portion constructed and arranged to driveably engage said driver member;

at least one pressure sensitive contact pad affixed to the topside of said central portion for engagement with said pressure sensitive pad affixed to the underside of said driver member; and

means for driveably and removably mounting a floor pad or the like located on the underside of said outwardly extending flange;

whereby the rotating floor pad may be driven in a rotary fashion and easily replaced.

10. The drive system as defined in Claim 9 wherein said pressure sensitive pads utilize hook and loop contact surfaces.

11. The drive system as defined in Claim 10 wherein said driver member and said central portion are polygons.

12. The drive system as defined in Claim 11 wherein said central portion fits within said driver member.

13. The drive system as defined in Claim 12 wherein said means for driveably and removably mounting a floor pad includes a hook and loop contact system.

14. The drive system as defined in Claim 13 wherein said means for driveably and removably mounting a floor pad further includes means for mechanically and removably mounting said floor pad to said driver member.

15. The drive system as defined in Claim 9 wherein said means for driveably and removably mounting a floor pad includes a hook and loop contact attachment system.

16. The drive system as defined in Claim 15 wherein said means for driveably and removably mounting a floor pad further includes means for mechanically and removably mounting said floor pad to said central portion of said driver member.

17. A system for removably mounting a floor pad or the like and a holder for the same to a rotary driver, said system comprising:

a driver member;

at least one contact pad affixed to the underside of said driver member;

at least one contact pad affixed to the holder for the floor pad or the like for engagement with said contact pad affixed to the underside of said driver member;

said contact pads remaining attached to each other when brought into contact with the other;

whereby said pad holder is positioned and removably mounted in said driver member by said contact pads.

18. The system as defined in Claim 17 wherein said contact pads utilize a hook and loop pressure contact attachment system.

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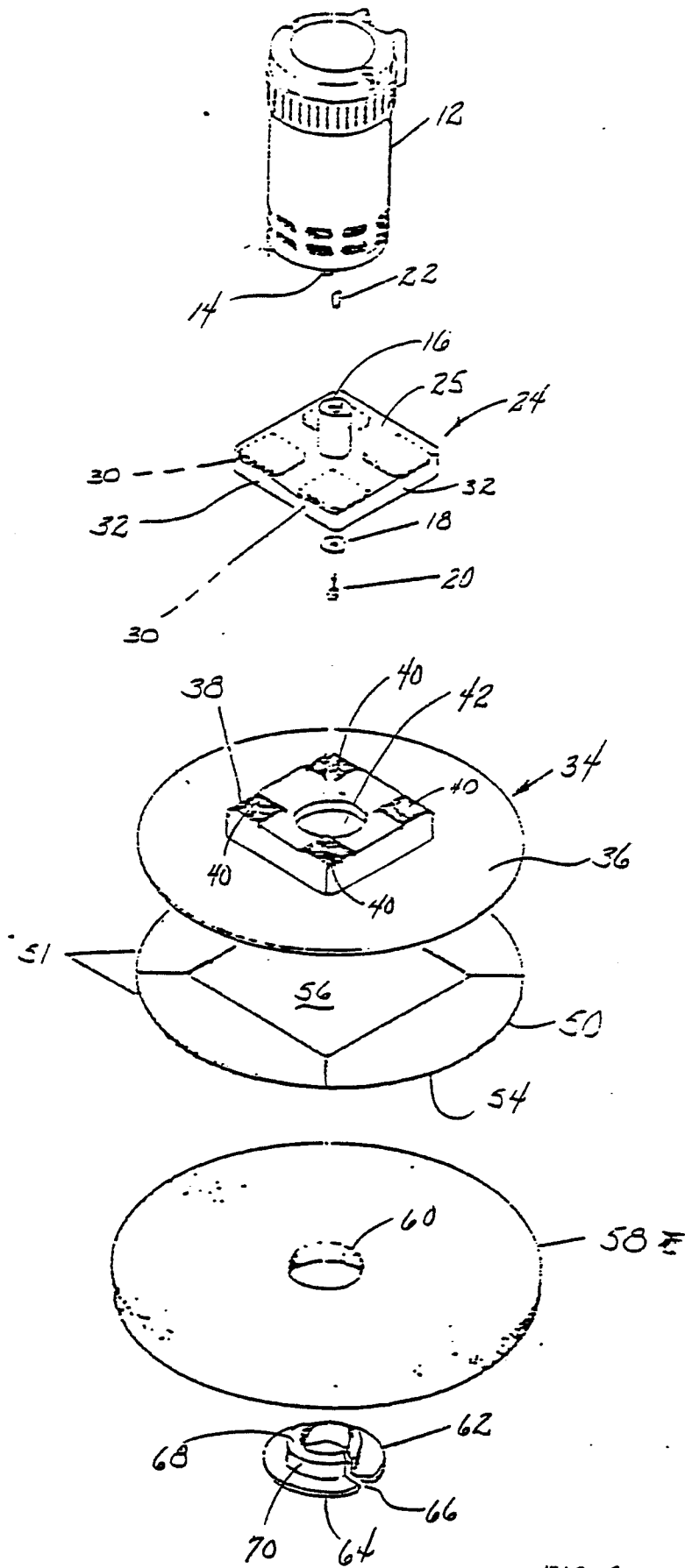


FIG. 1

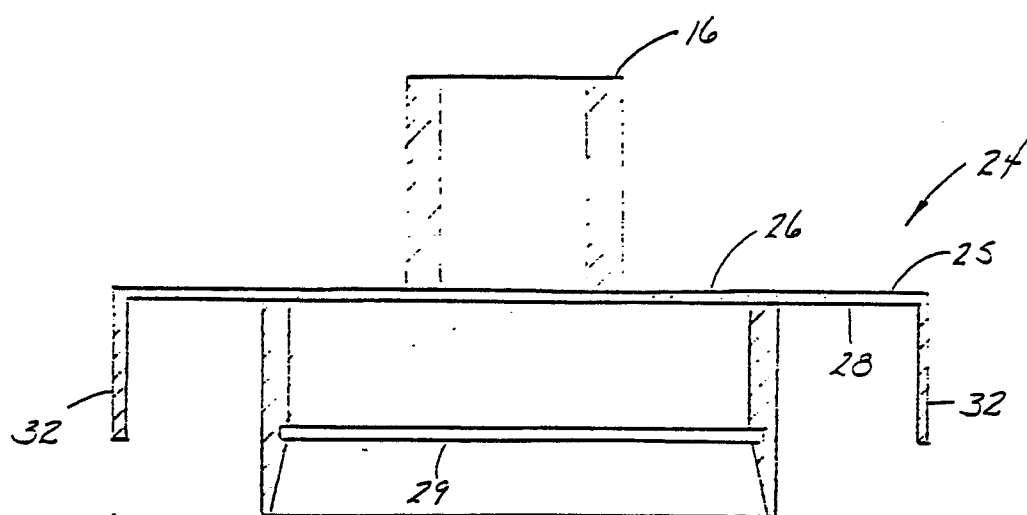
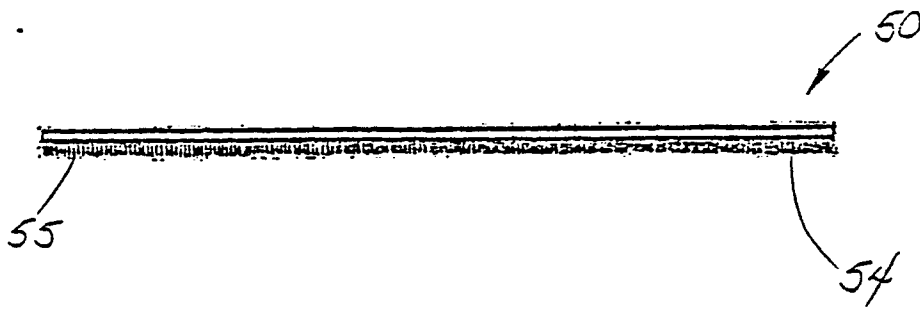
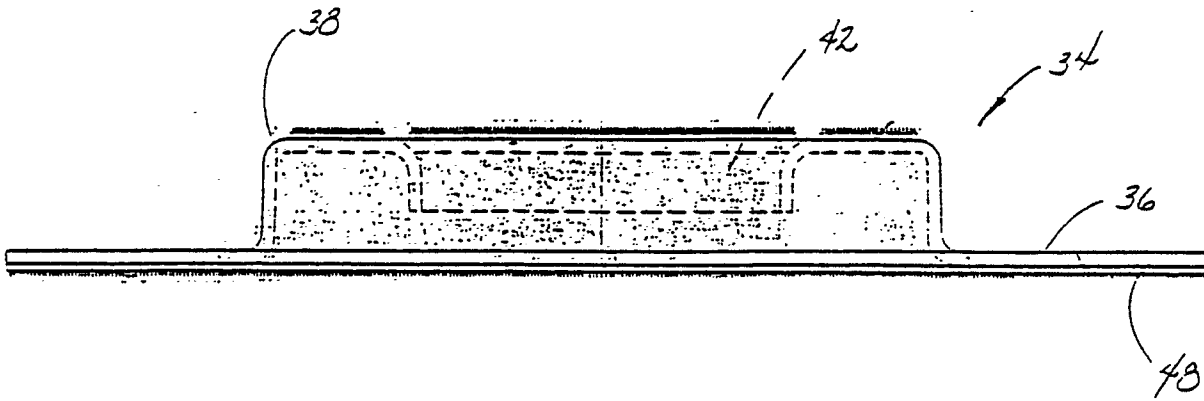


FIG 2





EP 86 11 6487

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)
Y	FR-A-1 259 313 (BONFANTI) * claims 1, 6, 7; figure 5, positions 32, 33 *	1, 2, 9, 17	A 47 L 11/10
Y	US-A-3 655 444 (YOUNG) * claims 1, 4; figures 1, 2, position 41 *	1, 2, 9, 17	
A	DE-U-1 898 046 (FAKIR-WERK) * claim 1, figure 1 *	1	
A	US-A-2 911 661 (BALES) * figure 6 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			A 47 L 11/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 05-03-1987	Examiner SCHLAITZ J
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	