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(54) STEAM-GENERATING DEVICE

(57) Steam generating device (1) comprising a steam jet (2) connected by means of a conduit (4) to a base (3) having a base body (5) with a platform (6) and a removable water tank (7) supported with a lower surface (71) on the platform (6) next to a side wall (51) of the base body (5), the tank (7) having a handle (8) for handling.

In order to facilitate the assembly of the tank on the base body, the handle (8) is hingeably attached to the tank (7) in a joint (9) and the center of gravity (G) of the tank (7) mounted on the base, at least when it is partially or completely filled with water, it is offset with respect to a vertical line (76) passing through the joint (9).

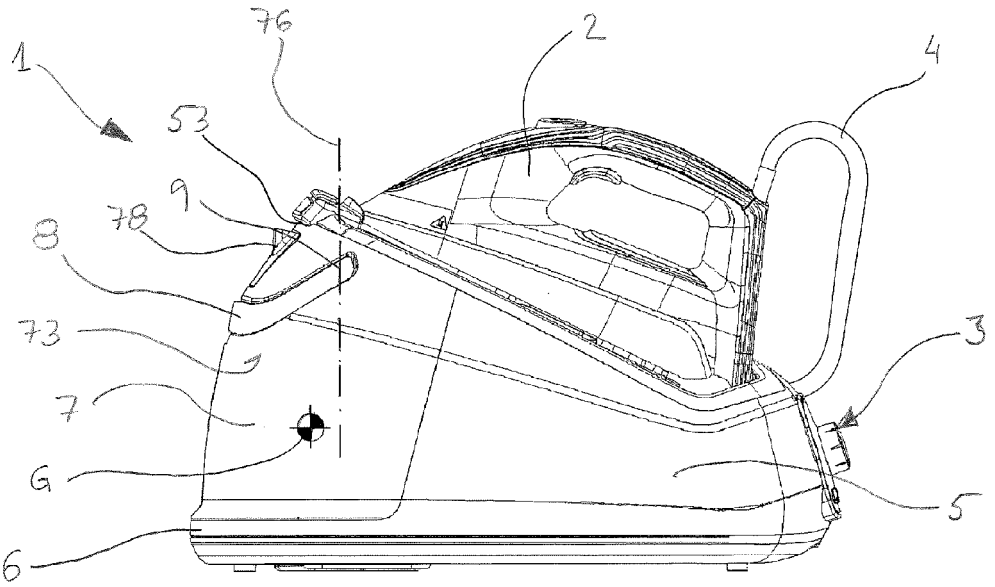

FIG.1

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Description

[0001] The present invention is in the field of steam generating devices which comprise a steam jet connected by a conduit to a base having a base body with a platform and a removable water tank supported with a lower surface on the platform next to a side wall of the base body, the tank having a handle for handling.

[0002] EP 2132372 B1 describes a vaporization system comprising a steam jet connected to a base having a base body with a steam generator and a removable water reservoir for containing and supplying water to the steam generator connectable to the base body. The water reservoir is mounted on the base body by sliding it horizontally.

[0003] The object of the present invention is a steam generating device with a removable water tank that is easy to mount on the base body of the steam generating system.

[0004] This object is achieved by means of a steam generating device comprising a steam jet connected by a conduit to a base having a base body with a platform and a removable water tank supported with a lower surface on the platform next to a side wall of the base body, the tank has a handle for handling, where the handle is hingeably attached to the tank in a joint and the center of gravity of the tank mounted on the base, at least when it is partially or completely filled with water, it is offset with respect to a vertical line passing through the joint.

[0005] The steam generating device can be a steam ironing center, a steamer, a steam propellant or the like. The steam jet can be a clothes iron, a brush, a straightener, a jet or the like which is connected through a conduit to a base where the removable water tank is located. The steam generating system has at least one steam generator that can be arranged on the base and/or in the steam jet. The water tank is connected to the steam generator by means of a water pump that directs the water from the tank to the steam generator through a connecting tube. When the steam generator is only on the steam jet, the connecting tube passes through the inside of the conduit. Cables can also be routed through the conduit to connect the steam jet control to the steam generating system control and/or the base control. The base has a base body to which the conduit is connected and an outer perimeter to which the removable water tank is connected. The base body is preferably externally formed by a plastic casing in which the operating controls of the apparatus can be present and it may have a top on which the steam jet can rest or a grip to hold the steam jet. The base body has a platform on a side wall part of its outer perimeter. The platform is part of the surface of the base body formed by cutting the volume that the tank occupies at the base towards the interior of the base. The space above the platform is open and free to be able to mount the tank vertically. The platform can therefore be formed by part of the side wall of the base body and an extension below it with a surface at an angle to the surface of the wall or it may only be a tilted side wall of the base body. At least part of that free space is occupied by the water tank when it is mounted on the platform. The water tank has a handle for handling that is hinged to the tank in a joint. The joint can be a kneecap-like connection point or an axis of rotation defined by a connection axis or an axis of rotation defined by two connection points of the handle to the tank. The center of gravity of the tank, at least when it is at least partially filled with water, it is offset at a distance from an imaginary vertical line passing through the joint. Preferably, the center of gravity of the tank is offset from any imaginary vertical line passing through the joint to a position closer to the perimeter of the base. Preferably, the handle is articulated to the tank at two points defining a handle axis of rotation as a joint and the center of gravity of the tank in the assembled position on the base is offset towards the outside of the base with respect to the vertical plane passing through the joint.

[0006] In this way, it is guaranteed that the tank can be assembled and disassembled vertically on the platform of the base body in a simpler way by avoiding collisions with the base body since when lifting the tank by the handle, the tank, by gravity, takes a position where it moves away from it. If the center of gravity of the tank in assembled position is offset towards the outside of the base with respect to an imaginary vertical line passing through the joint of the handle, when lifting the tank by the handle away from the platform, the tank tilts away from the side wall of the base body and when supporting the tank on the platform in its mounting position, it rotates around the contact point with the platform around the joint approaching the base body. This ensures that the tank is fixed by its own weight on the platform of the base body in a simplified way.

[0007] The tank has an inner surface that in the assembled position on the base faces the side surface of the base body and an external surface that in the assembled position on the base faces the outside of the base, where the handle is attached to the external surface. In addition, the external surface has a protrusion where the handle can be inserted in a folded position so that it is recessed into the surface of the tank and can be easily removed again by means of a cutout in the external surface of the tank that gives access to the handle.

[0008] In order to facilitate the fitting of the tank on the platform and the guidance of the tank during coupling with the base body, a rib is provided on the outer perimeter of the platform where an outer edge of the lower surface of the tank is fitted.

[0009] A water outlet is arranged on the lower surface of the tank and a water inlet to the base body is arranged on the platform facing each other with the tank in assembled position on the base so that there is a water connection to the steam generator of the device. The connection between the water inlet and the water outlet can be made by means of an actuator at the water inlet that exerts pressure on a valve arranged in the tank located at the water outlet.

[0010] In one embodiment of the tank, when it is in the disassembled position and loaded with water at least in part and is hanging freely from the handle, the vertical line passing through the center of gravity of the tank, passes through the joint of the handle, and a coupling portion of the tank is further away from the joint of the handle below this belongs to the lower surface of the tank which is tilted with respect to its coupled position on the platform. The lower surface of the tank is tilted facing towards the platform of the base body and the lower end of the tank is the coupling portion which in the assembly/disassembly movement of the tank in the base body, is the first one that contacts the platform or the last one that it contacts when it is disassembled, and it is the part where the tank rotates in relation to the base body. This form of assembly/disassembly is very comfortable and facilitates the connection.

[0011] For a steadier fixing of the tank to the base body at the base, a flexible interlocking element is provided so that the tank is pressure-fixed to the base body by means of the flexible interlocking element. This interlocking element can be in the form of a pressure-clip or with elastic springs that move by pressure and are released with a simple pull.

[0012] Other advantages will appear from the following description of the drawings. An example embodiment of the present invention is depicted in the drawings. The drawings, description and claims contain numerous features in combination. The expert will advantageously also consider the characteristics individually and put them together in other reasonable combinations.

[0013] These show:

Figure 1 shows a side view of the steam generation system in the form of an ironing center,

Figure 2 shows a side view of the water tank in disassembled position,

Figure 3 shows a side view of the base body, and

Figure 4 shows a side view of the tank close to the base body in the assembly/disassembly phase.

[0014] Figure 1 shows a steam generating system 1 in the form of an ironing center with a base 3 and a steam jet 2 in the form of a clothes iron lying in a resting position on an upper surface of the base 3. The iron 2 is attached to the base 3 by means of a conduit 4. The base 3 is composed of a base body 5 and a removable water tank 7 coupled to the base body 5. The water tank 7 is connected by a water tube and a water pump with a boiler (not shown in the drawings) where the water is brought to a boil. In this case, the boiler is arranged in the base body 5. The boiler is connected to the iron 2 by means of a steam pipe which circulates inside the conduit 4 through which the water vapor is channeled to the outside of the steam generating system 1. In the steam jet 2, the iron in this case, there is a steam chamber (not shown) where the steam coming from the boiler is reheated to be distributed through the steam chamber outlets to the outside of the steam generating system. The device for controlling the operation of the system 1 is provided in base 3 with control commands accessible to the user.

[0015] The water tank 7 is in assembled position on base 3 on a platform 6 of the base body 5 and it has a water loading mouth 78 on its external surface 73. A folding handle 8 is also connected to the external surface 73 of the tank by means of a joint 9, in this case, being a side view, the second point of attachment of the handle 8 is not shown to the external surface 73 of the tank 7 which defines an axis of rotation of the handle with respect to the tank as a joint 9. For fixing the tank to the base body 5 in a more stable way, there is a interlocking element 53 between them. The center of gravity G of the tank 7 is offset towards the perimeter of the base with respect to the imaginary vertical line 76 passing through the joint 9.

[0016] Figure 2 shows the removable water tank 7 in its disassembled position from base 3 separated from the base body 5 and hanging by its own weight from the handle 8 articulated to the external surface 73 of the tank by means of the joint 9. The external surface 73 has a protrusion 75 in which the folded handle 8 can be inserted in the assembled position of the tank 7 on the base 5 as seen in Figure 1. The center of gravity G of the tank is aligned below the joint 9 in the imaginary vertical line 76 passing through joint 9 of the handle 8 with the tank 7. The tank 7 further has an inner surface 72 which in the assembled position on base 3, faces the side wall 51 of the base body 5 as seen in Figure 4. The tank 7 also has an outer edge 77 in its lower surface 71 that fits with a rib 61 of the platform 6 of the base body 5 as seen in Figure 4. The point of the tank 7 furthest from the joint 9 is the coupling portion 79 of the tank with the base body 5 as also seen in Figure 4.

[0017] Figure 3 shows a side view of the base body 5 where the platform 6 can be seen, and where the water inlet 62 in which the water outlet of the tank is connectable in the assembled position can also be seen. Moreover, the rib 61 where the outer edge of the lower surface of the tank is connected in the assembled position can be seen as well. The side wall 51 of the base body 5 is vertical in this case but could be tilted at an angle greater than 90° with the platform 6. Furthermore, the side wall 51 projects into the tank from the outer wall of the base body to fit the shape of the inner surface of the tank. This projection of the side wall 51 of the base body 5 facilitates the alignment of the tank 7 during its assembly on the base body.

[0018] Figure 4 shows a side view of the tank 7 in the assembly or disassembly position on the base body 5 in order to complete the base 3. The tank 7 is still completely hanging from the handle 8 and its center of gravity G is still aligned with the vertical line 76 passing through joint 9. The coupling portion 79 of the tank 7 faces the platform 6 and the outer edge 77 of the lower surface 71 of the tank 7 has been adjusted to the rib 61 of the platform 6

in order to guide the assembly of the tank on it, and the side wall 51 of the base body 5 with its shape projected towards the tank also guides the inner surface 72 of the tank during the assembly.

Reference symbols

[0019]

1	Steam generating device
2	steam jet
4	conduit
3	base
5	base body
6	platform
7	tank
8	handle
9	joint
51	side wall
53	interlocking element
61	rib
62	water inlet
71	lower surface
72	inner surface
73	external surface
75	protrusion
76	vertical line
77	outer edge
78	loading mouth
79	coupling portion
G	center of gravity

Claims

1. Steam generating device (1) comprising a steam jet (2) connected by means of a conduit (4) to a base (3) having a base body (5) with a platform (6) and a removable water tank (7) supported with a lower surface (71) on the platform (6) next to a side wall (51) of the base body (5), the tank (7) having a handle (8) for handling,
characterized in that the handle (8) is hingeably attached to the tank (7) in a joint (9) and the center of gravity (G) of the tank (7) mounted on the base, at least when it is partially or completely filled with water, it is offset with respect to a vertical line (76) passing through the joint (9).

2. Steam generating device according to claim 1, **characterized in that** the center of gravity (G) of the tank (7) is offset towards the outside of the base (3) with respect to a vertical line (76) passing through the joint (9).

3. Steam generating device according to anyone of the preceding claims, **characterized in that** the tank (7) has an inner surface (72) which, in the assembled position on the base (3), faces side surface (51) of the base body (5) and an external surface (73) which, in the assembled position on the base (3) faces the outside of the base, where the handle (8) is attached to the external surface (73).

4. Steam generating device according to anyone of the preceding claims, **characterized in that** the external surface (73) has a protrusion (75) where the handle (8) can be inserted in the folded position.

5. Steam generating device according to anyone of the preceding claims, **characterized in that** the handle (8) is articulated to the tank (7) at two points defining a handle axis of rotation as the joint (9) and the center of gravity (G) of the tank in assembled position on the base, is offset towards the outside of the base (3) with respect to a vertical plane passing through the joint.

6. Steam generating device according to anyone of the preceding claims, **characterized in that** the platform (6) has a rib (61) on its outer perimeter into which an outer edge (77) of the lower surface (71) of the tank is fitted.

7. Steam generating device (1) according to anyone of the preceding claims, **characterized in that** a water outlet is arranged on the lower surface (71) of the tank (7) and a water inlet (62) is arranged on the platform (6) to the base body facing each other with the tank (7) in assembled position on the base (3).

8. Steam generating device according to anyone of the preceding claims, **characterized in that**, in the disassembled position of the tank (7) loaded with water at least partly and hanging freely from the handle, the vertical line (76) passing through the center of gravity (G) of the tank, passes through the joint (9) of the handle.

9. Steam generating device according to claim 8, **characterized in that** a coupling portion (79) of the tank is further away from the joint of the handle below this belongs to the lower surface (71) of the tank which is tilted with respect to its coupled position on the platform (6).

10. Steam generating device according to anyone of the preceding claims, **characterized in that** the tank (7) is pressure-fixed to the base body (5) by means of a flexible interlocking element (53).

11. Steam generating device (1) according to anyone of the preceding claims, **characterized in that** it is a steam ironing center and the steam jet (2) is a steam iron.

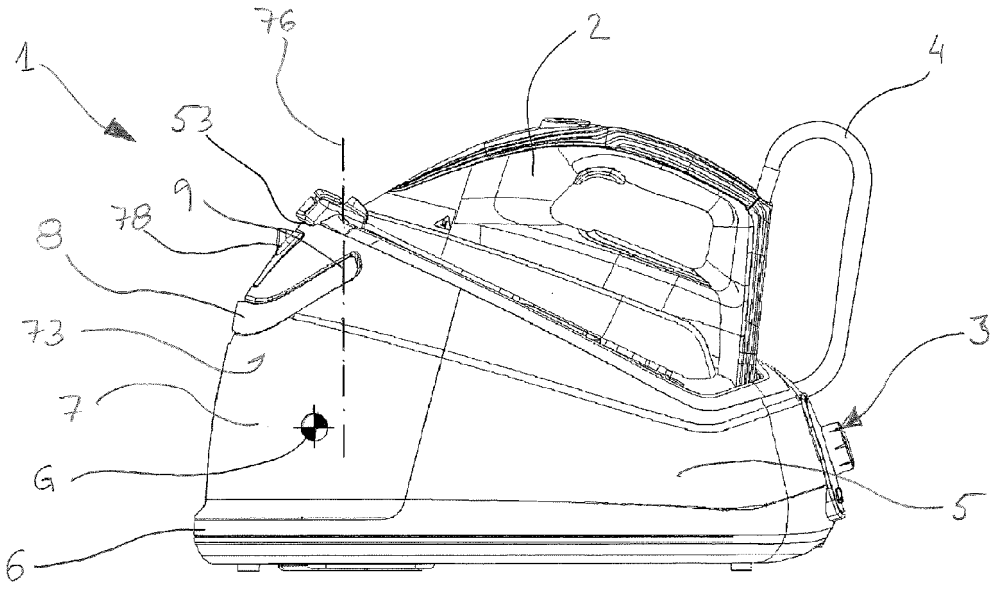

FIG.1

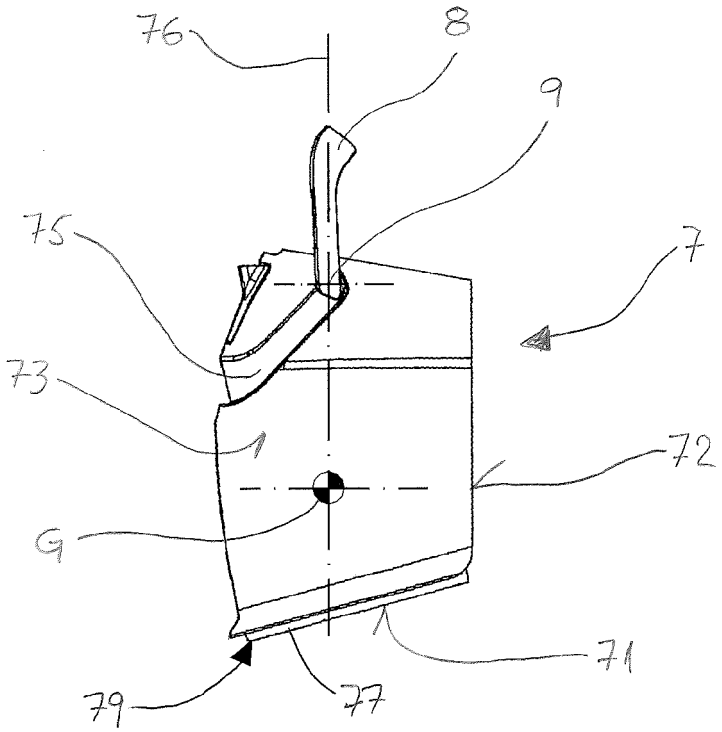

FIG.2

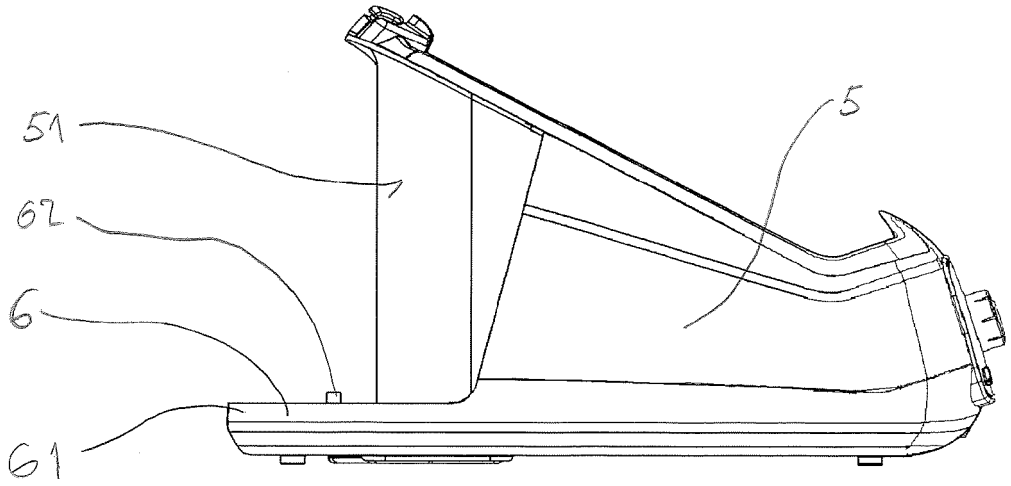

FIG.3

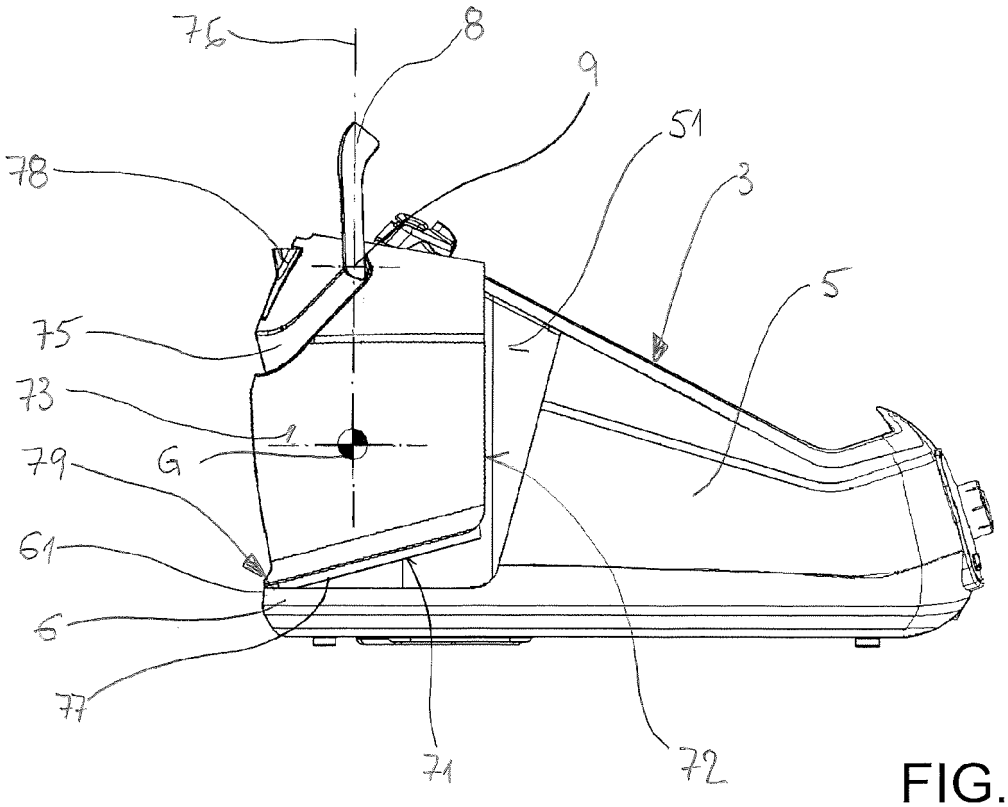

FIG.4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2019/070591

A. CLASSIFICATION OF SUBJECT MATTER

D06F75/12 (2006.01)

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)
D06F

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)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	CN 206050502U U (JINAN XIUJIAN MACHINE MFG CO LTD) 29/03/2017, figure 1,	1, 4
A	CN 203834246U U (TSANN KUEN ZHANGZHOU ENTPR CO) 17/09/2014, figures 1 - 3.	1-11
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A	FR 2874628 A1 (SEB SA) 03/03/2006, figures 1 - 2. claims 1-11;	1-11

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27/11/2019	**(04/12/2019)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer C. Alonso de Noriega Muñiz Telephone No. 91 3493023

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

Information on patent family members

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REFERENCES CITED IN THE DESCRIPTION

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