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(54) **A SWIMMING POOL ARRANGEMENT**

SCHWIMMBECKENANORDNUNG

AGENCEMENT DE PISCINE

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(56) References cited:
WO-A1-2015/196198 **US-A1- 2013 291 948**

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EP 3 715 560 B1

Description

[0001] The present invention relates to a swimming pool arrangement comprising a swimming pool, a heating device for heating water from the swimming pool, as well as a water supply system for supplying water from said swimming pool to said heating device and from said heating device to said swimming pool.

[0002] Such a swimming pool arrangement is generally known. Said water supply system usually comprises a water pump and water channels for pumping water from the swimming pool towards the heating device, for passing the water along the heating device in order to heat the water, as well as for pumping the heated water from the heating device towards the swimming pool, all through the water channels.

[0003] A disadvantage of said know swimming pool arrangement is that, in the event that the water pump is too powerful, the water is passed along the heating device too quickly, so that the water is insufficiently heated. On the other hand, in the event that the water pump is too weak (i.e. less powerful), the water pump may be turned off by a water stream safety device installed in the swimming pool arrangement. WO 2015/196198 A1 discloses a swimming pool arrangement according to the preamble of claim 1.

[0004] The object of the present invention is to provide an improved swimming pool arrangement, wherein the water is always properly heated at a desired temperature.

[0005] In order to accomplish that objective, a swimming pool arrangement according to the invention comprises a water supply system which comprises a three-way valve of a first type and a three-way valve of a second type, wherein

- said three-way valve of the first type is arranged to regulate the water supply from said swimming pool towards said heating device, and wherein said three-way valve of the first type is arranged to

  (i) shutting off the water supply towards said heating device and opening the water supply towards said three-way valve of the second type, in a first position of said three-way valve of the first type;
  (ii) opening the water supply towards said heating device and shutting off the water supply towards said three-way valve of the second type, in a second position of said three-way valve of the first type;
  (iii) opening the water supply towards said heating device and opening the water supply towards said three-way valve of the second type, in a third position of said three-way valve of the first type;

- said three-way valve of the second type is arranged to regulate the water supply from said three-way valve of the first type and/or said heating device towards said swimming pool,

characterized in that said three-way valve of the second type is arranged to

(i) shutting off the water supply from said heating device and opening the water supply from said three-way valve of the first type, in a first position of said three-way valve of the second type;
(ii) opening the water supply from said heating device and shutting off the water supply from said three-way valve of the first type, in a second position of said three-way valve of the second type;
(iii) opening the water supply from said heating device and opening the water supply from said three-way valve (5) of the first type, in a third position of said three-way valve of the second type.

[0006] Please note that the three-way valves of the first and second types are simultaneously in their first, second or third positions. In their first position, water from the swimming pool is short circuited and is pumped through the upper half of the water supply system, wherein the water is not passed through the heating device and is thus not heated. In their second position, water from the swimming pool is completely passed through the heating device, so that the water is heated at a maximum level (100%). In their third position, half of the water from the swimming pool is passed through the heating device, so that the water is heated at a medium level (50%).

[0007] Preferably, the water supply system has an H-shape between the swimming pool and the heating device.

[0008] In a preferred embodiment of a swimming pool arrangement in accordance with the invention, in a fourth position of said three-way valve of the first type, said three-way valve of the first type is arranged to half way opening the water supply towards said heating device, and wherein in a fourth position of said three-way valve of the second type, said three-way valve of the second type is arranged to half way opening the water supply from said heating device. Hence, in their fourth position, a quarter of the water from the swimming pool is passed through the heating device, so that the water is heated at a minimum level (25%).

[0009] In another preferred embodiment of a swimming pool arrangement according to the invention said three-way valve of the first type and said three-way valve of the second type are mutually identical (from a constructional point of view). Hence, each of said three-way valve of the first type and said three-way valve of the second type particularly have six positions to regulate the water supply, as will be explained in the description to the figures below.

[0010] In another preferred embodiment of a swimming pool arrangement in accordance with the invention said three-way valve of the first type and said three-way

valve of the second type can be operated manually, preferably using control knobs thereon in case of a manual operation. Said three-way valve of the first type and said three-way valve of the second type are made of PVC.

[0011] The present invention will now be explained in more detail with reference to the drawing, wherein

- figure 1 schematically shows in steps how heating water from a swimming pool can be fine regulated in a preferred embodiment according to the invention;
- figures 2a, 2b and 2c are perspective views and a top view of a three-way valve used in figure 1, respectively, and
- figure 3 shows a top view (top row in cross-section) and a side view (bottom row) of the three-way valve of figure 2, with a control knob in various positions to regulate water flow.

[0012] With reference to figure 1 a swimming pool arrangement or system 1 is shown provided with a swimming pool 2, a heating device 3 for heating water from the swimming pool 2, as well as a water supply system 4 (with a pump, not shown) for supplying water from said swimming pool 2 to said heating device 3 and from said heating device 3 to said swimming pool 2 in the direction of arrows shown. As indicated, the water supply system 4 has an H-shape between the swimming pool 2 and the heating device 3. In the water supply system 4 a three-way valve 5 of a first type (in figure 1 on the left of the H-shape) and a three-way valve 6 of a second type (in figure 1 on the right of the H-shape) are used. In the preferred embodiment shown both three-way valves 5,6 are mechanically identical and interchangeable.

[0013] In figure 1 in the far left picture A said three-way valve 5 is in a certain position, wherein it shuts off the water supply from the swimming pool 2 towards the heating device 3, and wherein it opens the water supply from the swimming pool 2 towards the other three-way valve 6. Simultaneously, the other thee-way valve 6 in a certain position opens the water supply from the three-way valve 5 towards the swimming pool 2 and shuts off the water supply from said heating device 3. Hence, water from the swimming pool 2 is short circuited and is pumped through the upper half of the H-shape of the water supply system 4, wherein the water is not passed through the heating device 3 and is thus not heated. This is shown by the arrows in the far left in figure 1. In the next picture B in figure 1 the three-way valve 5 is in a further position, wherein it opens the water supply from the swimming pool 2 towards said heating device 3 and wherein it shuts off the water supply from the swimming pool 2 towards the other three way valve 6. In a next position the latter three-way valve 6 opens the water supply from the heating device 3 towards said swimming pool 2, but closes the water supply from the three-way valve 5. Hence, water from the swimming pool 2 is heated at a maximum level (100%). This is shown by the arrows. In the next picture C in figure 1 the three-way valve 5 is in a further position, wherein it opens the water supply from the swimming pool 2 towards said heating device 3, and wherein it also opens the water supply from the swimming pool 2 towards the other three way valve 6. In a next position the latter three-way valve 6 opens the water supply from the heating device 3 towards said swimming pool 2 and also opens the water supply from the three-way valve 5 towards the swimming pool 2. Hence, water from the swimming pool 2 is heated at a medium level (50%). This is shown by the arrows. In the far right picture D of figure 1 the three-way valve 5 is in a further position, wherein it opens the water supply for 50% from the swimming pool 2 towards said heating device 3, and wherein it opens the water supply from the swimming pool 2 towards the other three way valve 6. In a next position the latter three-way valve 6 opens the water supply from the heating device 3 towards said swimming pool 2 and also opens the water supply for 50% from the three-way valve 5 towards the swimming pool 2. Hence, water from the swimming pool 2 is heated at a minimum level (25%). This is shown by the arrows. Note that the three-way valves 5,6 are always open at their sides towards the swimming pool 2.

[0014] Three-way valve 5,6 is depicted more in detail in figures 2a, 2c (perspective view) and 2b (top view). A manual control knob 7 is mounted on top of the three-way valve 5,6 and is arranged to put the three-way valve 5,6 in various positions (allowing to pass the water supply for 100%, 50% or 25% or shutting off the water supply). The three-way valve 5,6 of figures 2a and 2b has external screw thread 8 for connection to pipes (not shown) of the water supply system 4. The embodiment shown in figure 2c has 1½ inch internal screw thread 9 for the connection of a hose connector (not shown). As shown in figure 2b the three-way valves 5,6 each have six positions:

- when the control knob 7 or handle is in position "1" (three-way valve 5 in picture A), the outlet close to position "1" is closed, outlets close positions "3" and "4" are open;
- when the handle is in position "5" (three-way valve 5 in picture D)", the outlet close to position "1" is half open, outlets close position "3" and "4"are open;
- when the handle is in position"2" (three-way valves 5,6 in picture C), the outlets close to position"1", "3"and "4" all are open;
- when the handle is in position "6" (three-way valve 6 in picture D), the outlet close to position "3" is half open, outlets close position "1" and "4" are open;
- when the handle is in position "3" (three-way valve 6 in picture A), the outlet close to position "3" is closed, outlets close position "1" and "4" are open;

- when the handle is in position "4" (three-way valves 5,6 in picture B), the outlet close to position "4" is closed, outlets close position "1" and "3" are open.

[0015] The three-way valve 5,6 is also called "bypass set universal six-way valve".

[0016] Figure 3 shows in the top row cross-sectional views of the three-way valve 5,6 along the lines A-A through F-F seen in the bottom row, each time for different positions of the control knob/handle 7, i.e. for the positions 1 through 6, as explained above. Corresponding parts have been designated with the same reference numerals. As depicted, by turning the control knob/handle 7 into a certain position, an internal closing device 9 inside the three-way valve 5,6 is simultaneously moved as well in order to close off (partly) one of the three ways of the three-way valve 5,6.

[0017] The present invention is not restricted to the embodiment shown in the figures, but extends also to other preferred variants falling under the scope of the appended claims.

Claims

1. A swimming pool arrangement (1) comprising a swimming pool (2), a heating device (3) for heating water from the swimming pool (2), as well as a water supply system (4) for supplying water from said swimming pool (2) to said heating device (3) and from said heating device (3) to said swimming pool (2), wherein said water supply system (4) comprises a three-way valve (5) of a first type and a three-way valve (6) of a second type, wherein

- said three-way valve (5) of the first type is arranged to regulate the water supply from said swimming pool (2) towards said heating device (3), and wherein said three-way valve (5) of the first type is arranged to

(i) shutting off the water supply towards said heating device (3) and opening the water supply towards said three-way valve (6) of the second type, in a first position of said three-way valve (5) of the first type;
(ii) opening the water supply towards said heating device (3) and shutting off the water supply towards said three-way valve (6) of the second type, in a second position of said three-way valve (5) of the first type;
(iii) opening the water supply towards said heating device (3) and opening the water supply towards said three-way valve (6) of the second type, in a third position of said three-way valve (5) of the first type;

- said three-way valve (6) of the second type is arranged to regulate the water supply from said three-way valve (5) of the first type and/or said heating device (3) towards said swimming pool (2), **characterized in that** said three-way valve (6) of the second type is arranged to

(i) shutting off the water supply from said heating device (3) and opening the water supply from said three-way valve (5) of the first type, in a first position of said three-way valve (6) of the second type;
(ii) opening the water supply from said heating device (3) and shutting off the water supply from said three-way valve (5) of the first type, in a second position of said three-way valve of the second type;
(iii) opening the water supply from said heating device (3) and opening the water supply from said three-way valve (5) of the first type, in a third position of said three-way valve (6) of the second type.

2. A swimming pool arrangement (1) according to claim 1, wherein said three-way valve (5) of the first type is open for water supply from the swimming pool (2) in its first, second and third positions.

3. A swimming pool arrangement (1) according to claim 1 or 2, wherein said three-way valve (6) of the second type is open for water supply towards the swimming pool (2) in its first, second and third positions.

4. A swimming pool arrangement (1) according to claim 1, 2 or 3, wherein in a fourth position of said three-way valve (5) of the first type, said three-way valve (5) of the first type is arranged to half way opening the water supply towards said heating device (3), and wherein in a fourth position of said three-way valve (6) of the second type, said three-way valve (6) of the second type is arranged to half way opening the water supply from said heating device (3).

5. A swimming pool arrangement (1) according to any of the preceding claims 1 through 4, wherein said three-way valve (5) of the first type and said three-way valve (6) of the second type are mutually identical.

6. A swimming pool arrangement (1) according to claim 5, wherein each of said three-way valve (5) of the first type and said three-way valve (6) of the second type have six positions to regulate the water supply.

7. A swimming pool arrangement (1) according to any of the preceding claims 1 through 6, wherein said three-way valve (5) of the first type and said three-way valve (6) of the second type can be operated manually.

8. A swimming pool arrangement (1) according to any of the preceding claims 1 through 7, wherein said three-way valve (5) of the first type and said three-way valve (6) of the second type are made of PVC.

Patentansprüche

1. Eine Schwimmbadanordnung (1) aufweisend ein Schwimmbad (2), eine Heizvorrichtung (3) zum Erwärmen von Wasser des Schwimmbads (2) sowie einem Wasserversorgungssystem (4) zum Zuführen von Wasser aus dem Schwimmbad (2) zur Heizvorrichtung (3) und von der Heizvorrichtung (3) zum Schwimmbad (2), wobei das Wasserversorgungssystem (4) ein Dreiwegeventil (5) eines ersten Typs und ein Dreiwegeventil (6) eines zweiten Typs umfasst, wobei

   - das Dreiwegeventil (5) des ersten Typs so ausgelegt ist, dass es die Wasserzufuhr vom Schwimmbad (2) zur Heizvorrichtung (3) reguliert, und wobei das Dreiwegeventil (5) des ersten Typs so eingerichtet ist, dass es

     (i) in einer ersten Stellung des Dreiwegeventils (5) des ersten Typs die Wasserzufuhr zur Heizvorrichtung (3) absperrt und die Wasserzufuhr zum Dreiwegeventil (6) des zweiten Typs öffnet;
     (ii) in einer zweiten Stellung des Dreiwegeventils (5) des ersten Typs die Wasserzufuhr zur Heizvorrichtung (3) öffnet und die Wasserzufuhr zum Dreiwegeventil (6) des zweiten Typs absperrt;
     (iii) in einer dritten Stellung des Dreiwegeventils (5) des ersten Typs die Wasserzufuhr zur Heizvorrichtung (3) öffnet und die Wasserzufuhr zum Dreiwegeventil (6) des zweiten Typs öffnet;

   - das Dreiwegeventil (6) des zweiten Typs so ausgelegt ist, dass es die Wasserzufuhr vom Dreiwegeventil (5) des ersten Typs und/oder der Heizvorrichtung (3) zum Schwimmbecken (2) reguliert, **dadurch gekennzeichnet, dass** das Dreiwegeventil (6) des zweiten Typs so eingerichtet ist, dass es

     (i) in einer ersten Stellung des Dreiwegeventils (6) des zweiten Typs die Wasserzufuhr von der Heizvorrichtung (3) absperrt und die Wasserzufuhr vom Dreiwegeventil (5) des ersten Typs öffnet;
     (ii) in einer zweiten Stellung des Dreiwegeventils des zweiten Typs die Wasserzufuhr von der Heizvorrichtung (3) öffnet und die Wasserzufuhr vom Dreiwegeventil (5) des ersten Typs absperrt;
     (iii) in einer dritten Stellung des Dreiwegeventils (6) des zweiten Typs die Wasserzufuhr von der Heizvorrichtung (3) öffnet und die Wasserzufuhr vom Dreiwegeventil (5) des ersten Typs öffnet.

2. Die Schwimmbadanlage (1) nach Anspruch 1, wobei das Dreiwegeventil (5) des ersten Typs in seiner ersten, zweiten und dritten Stellung für die Wasserzufuhr aus dem Schwimmbad (2) geöffnet ist.

3. Die Schwimmbadanlage (1) nach Anspruch 1 oder 2, wobei das Dreiwegeventil (6) des zweiten Typs in seiner ersten, zweiten und dritten Stellung für die Wasserzufuhr zum Schwimmbad (2) geöffnet ist.

4. Die Schwimmbadanordnung (1) nach Anspruch 1, 2 oder 3, wobei in einer vierten Stellung des Dreiwegeventils (5) des ersten Typs das Dreiwegeventil (5) des ersten Typs so eingerichtet ist, dass es die Wasserzufuhr zur Heizvorrichtung (3) halb öffnet, und wobei in einer vierten Stellung des Dreiwegeventils (6) des zweiten Typs das Dreiwegeventil (6) des zweiten Typs so eingerichtet ist, dass es die Wasserzufuhr von der Heizvorrichtung (3) halb öffnet.

5. Die Schwimmbadanordnung (1) nach einem der vorangehenden Ansprüche 1 bis 4, wobei das Dreiwegeventil (5) des ersten Typs und das Dreiwegeventil (6) des zweiten Typs zueinander identisch sind.

6. Die Schwimmbadanordnung (1) nach Anspruch 5, wobei das Dreiwegeventil (5) des ersten Typs und das Dreiwegeventil (6) des zweiten Typs jeweils sechs Stellungen zur Regulierung der Wasserzufuhr aufweisen.

7. Die Schwimmbadanordnung (1) nach einem der vorhergehenden Ansprüche 1 bis 6, wobei das Dreiwegeventil (5) des ersten Typs und das Dreiwegeventil (6) des zweiten Typs manuell betätigt werden können.

8. Die Schwimmbadanordnung (1) nach einem der vorhergehenden Ansprüche 1 bis 7, wobei das Dreiwegeventil (5) des ersten Typs und das Dreiwegeventil (6) des zweiten Typs aus PVC hergestellt sind.

Revendications

1. Agencement de piscine (1) comprenant une piscine (2), un dispositif de chauffage (3) destiné à chauffer l'eau de la piscine (2), de même qu'un dispositif d'alimentation en eau (4) destiné à délivrer de l'eau à partir de ladite piscine (2) vers ledit dispositif de chauffage (3) et à partir dudit dispositif de chauffage

(3) vers ladite piscine (2), dans lequel ledit dispositif d'alimentation en eau (4) comprend une vanne à trois voies (5) d'un premier type et une vanne à trois voies (6) d'un second type, dans lequel ladite vanne à trois voies (5) du premier type est agencée de manière à réguler l'alimentation en eau à partir de ladite piscine (2) vers ledit dispositif de chauffage (3), et dans lequel ladite vanne à trois voies (5) du premier type est agencée de manière à

(i) couper l'alimentation en eau vers ledit dispositif de chauffage (3) et ouvrir l'alimentation en eau vers ladite vanne à trois voies (6) du second type, dans une première position de ladite vanne à trois voies (5) du premier type ;
(ii) ouvrir l'alimentation en eau vers ledit dispositif de chauffage (3) et couper l'alimentation en eau vers ladite vanne à trois voies (6) du second type, dans une deuxième position de ladite vanne à trois voies (5) du premier type ;
(iii) ouvrir l'alimentation en eau vers ledit dispositif de chauffage (3) et ouvrir l'alimentation en eau vers ladite vanne à trois voies (6) du second type, dans une troisième position de ladite vanne à trois voies (5) du premier type ;

ladite vanne à trois voies (6) du second type est agencée de manière à réguler l'alimentation en eau à partir de ladite vanne à trois voies (5) du premier type et/ou dudit dispositif de chauffage (3) vers ladite piscine (2), **caractérisé en ce que** ladite vanne à trois voies (6) du second type est agencée de manière à

(i) couper l'alimentation en eau à partir dudit dispositif de chauffage (3) et ouvrir l'alimentation en eau à partir de ladite vanne à trois voies (5) du premier type, dans une première position de ladite vanne à trois voies (6) du second type ;
(ii) ouvrir l'alimentation en eau à partir dudit dispositif de chauffage (3) et couper l'alimentation en eau à partir de ladite vanne à trois voies (5) du premier type, dans une deuxième position de ladite vanne à trois voies du second type ;
(iii) ouvrir l'alimentation en eau à partir dudit dispositif de chauffage (3) et ouvrir l'alimentation en eau à partir de ladite vanne à trois voies (5) du premier type, dans une troisième position de ladite vanne à trois voies (6) du second type.

2. Agencement de piscine (1) selon la revendication 1, dans lequel ladite vanne à trois voies (5) du premier type est ouverte afin de délivrer de l'eau à partir de la piscine (2) dans ses première, deuxième et troisième positions.

3. Agencement de piscine (1) selon la revendication 1 ou 2, dans lequel ladite vanne à trois voies (6) du second type est ouverte afin de délivrer de l'eau vers la piscine (2) dans ses première, deuxième et troisième positions.

4. Agencement de piscine (1) selon la revendication 1, 2 ou 3, dans lequel, dans une quatrième position de ladite vanne à trois voies (5) du premier type, ladite vanne à trois voies (5) du premier type est agencée de manière à ouvrir à moitié l'alimentation en eau vers ledit dispositif de chauffage (3), et dans lequel, dans une quatrième position de ladite vanne à trois voies (6) du second type, ladite vanne à trois voies (6) du second type est agencée de manière à ouvrir à moitié l'alimentation en eau à partir dudit dispositif de chauffage (3).

5. Agencement de piscine (1) selon l'une quelconque des revendications 1 à 4 précédentes, dans lequel ladite vanne à trois voies (5) du premier type et ladite vanne à trois voies (6) du second type sont mutuellement identiques.

6. Agencement de piscine (1) selon la revendication 5, dans lequel chacune de ladite vanne à trois voies (5) du premier type et de ladite vanne à trois voies (6) du second type comporte six positions permettant de réguler l'alimentation en eau.

7. Agencement de piscine (1) selon l'une quelconque des revendications 1 à 6 précédentes, dans lequel ladite vanne à trois voies (5) du premier type et ladite vanne à trois voies (6) du second type peuvent être activées manuellement.

8. Agencement de piscine (1) selon l'une quelconque des revendications 1 à 7 précédentes, dans lequel ladite vanne à trois voies (5) du premier type et ladite vanne à trois voies (6) du second type sont réalisées en PVC.

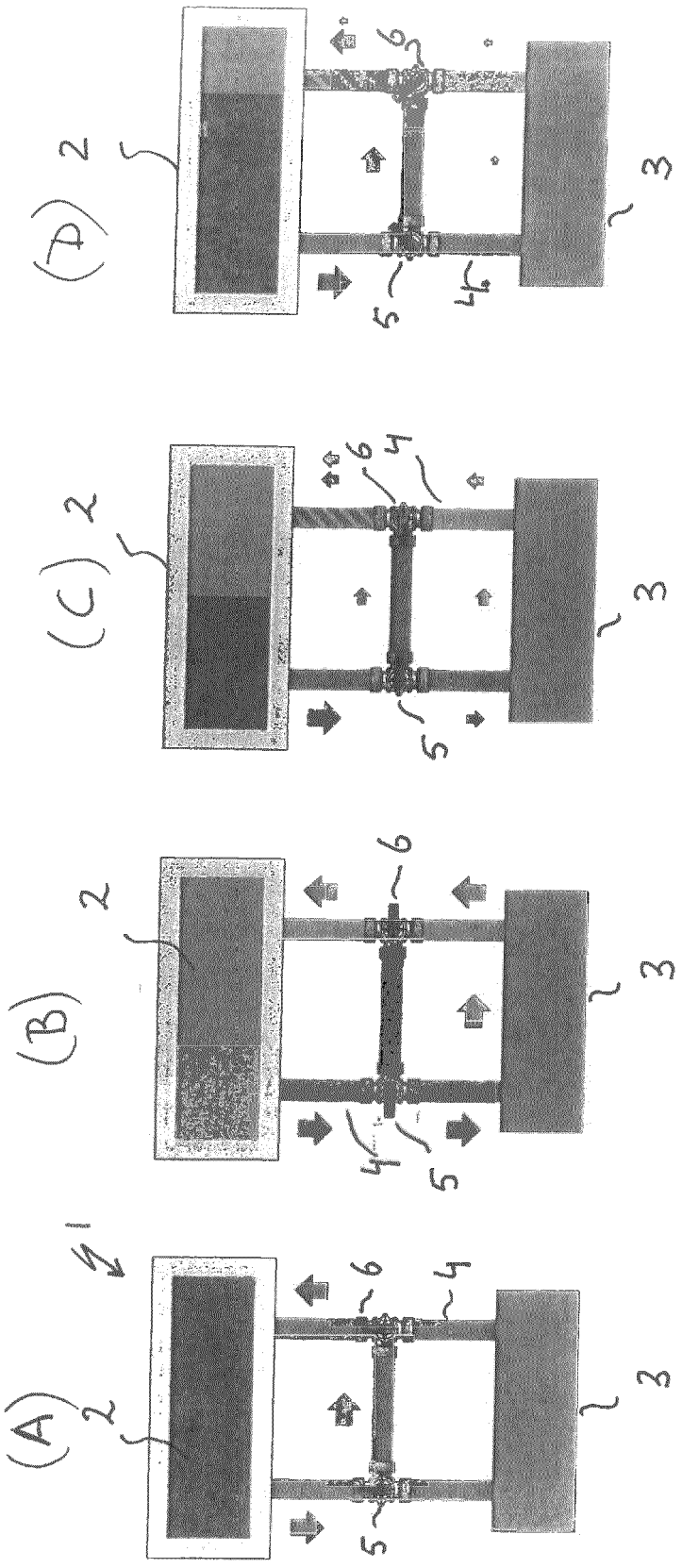


FIG. 1

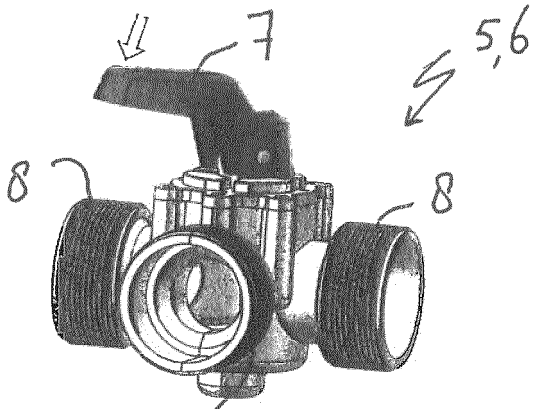


FIG. 2A

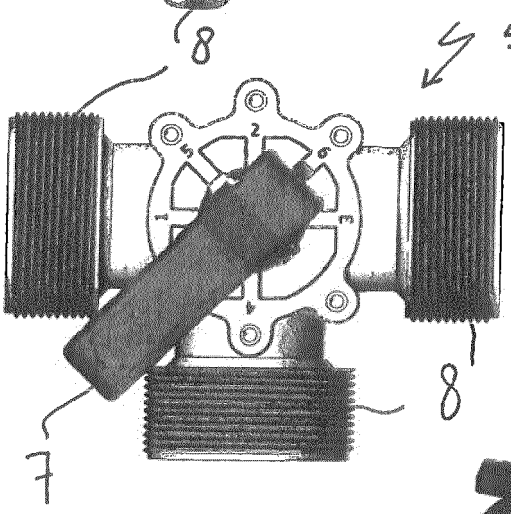


FIG. 2B

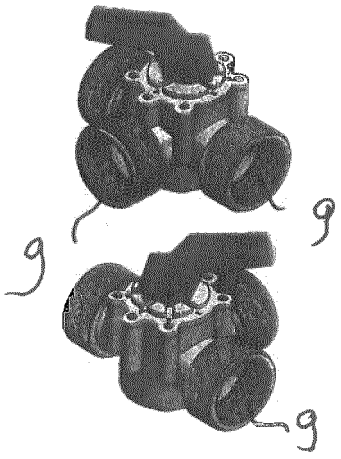


FIG. 2C

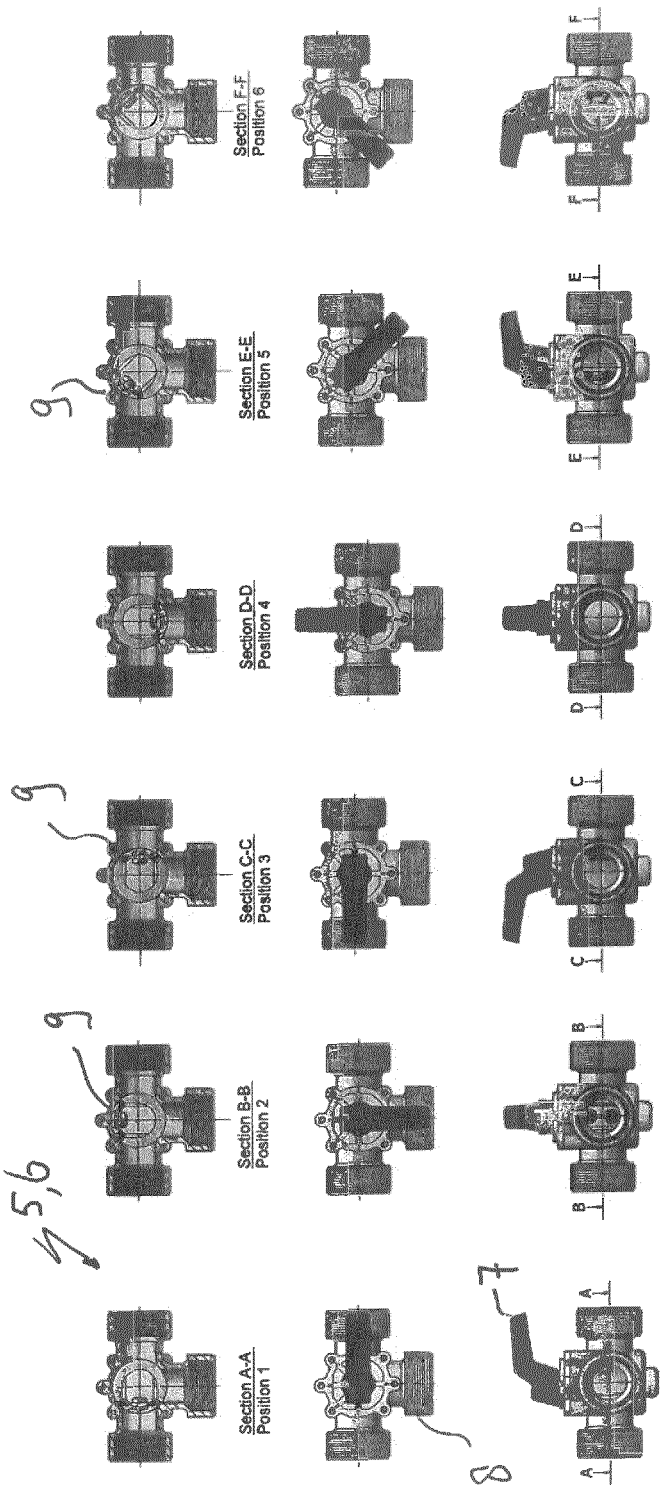

Section A-A
Position 1
Section B-B
Position 2
Section C-C
Position 3
Section D-D
Position 4
Section E-E
Position 5
Section F-F
Position 6
5,6
9
9
9
7
8
A
A
B
B
C
C
D
D
E
E
F
F

FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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