

# Exhibit 7

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21 SMC Corporation of America

22 UNITED STATES DISTRICT COURT  
23 FOR THE CENTRAL DISTRICT OF CALIFORNIA

24 TOKYO KEISO COMPANY, LTD., ) Civil Action No. SACV 06-374 ODW  
25 ET AL. ) (RNBx)

26 Plaintiffs,

27 v.

28 SMC CORPORATION, ET AL.

Defendants.

) **DECLARATION OF LAWRENCE C.  
LYNNWORTH IN SUPPORT OF  
SMC'S MOTION FOR SUMMARY  
JUDGMENT OF INVALIDITY  
(OBVIOUSNESS)**

) Assigned to: Hon. Otis D. Wright II

) Trial Date: October 9, 2007

DECLARATION OF LAWRENCE C. LYNNWORTH  
IN SUPPORT OF SMC'S MOTION FOR SUMMARY  
JUDGMENT OF INVALIDITY (OBVIOUSNESS)

1 I, Lawrence C. Lynnworth, declare:

2 1. I have been working in the ultrasonic flowmeter field for the past 45  
3 years. I received a B.E.E. (Bachelor of Electrical Engineering) from New York  
4 University in 1958 and a M.S. degree from Stanford University in 1959. I am an  
5 inventor or co-inventor in some 48 United States patents and a number of  
6 corresponding foreign patents. Most of these patents are in the ultrasonic  
7 flowmeter field. I have authored or co-authored some 200 publications and articles  
8 as well as chapters in seven books. Most of these publications, articles and  
9 chapters are in the ultrasonic flowmeter field. I was for many years the vice  
10 president for control instrumentation research and development at Panametrics,  
11 Inc., Waltham, Massachusetts. I was Chief Technologist with GE Panametrics  
12 after GE acquired Panametrics. A detailed listing of my qualifications in the  
13 ultrasonic flowmeter field is attached hereto as exhibits A, B and C.

14 2. I have been asked to opine on the obviousness of the subject matter of  
15 claims 1, 2 and 5 of United States patent 5,458,004 ("the '004 patent"). I have  
16 reviewed this patent and these claims and have also reviewed prior art United  
17 States patent 5,060,507 to Urmson et al. ("the Urmson patent") and a prior art  
18 article which I authored - "Engineering Aspects of Ultrasonic Process Control-  
19 Flow, Temperature and Liquid Level Applications," 108 Journal of Vibration  
20 Acoustics, Stress, and Reliability Design 69-81 at 72 (1986) ("JVASRD"). I have  
21 concluded for the following reasons that the subject matter of claims 1, 2 and 5 of  
22 the '004 patent would have been obvious to one of ordinary skill in the ultrasonic  
23 flowmeter art prior to September 1, 1993, the earliest claimed foreign priority date  
24 for the '004 patent.

25 3. The cover page for the '004 patent is set forth below.  
26  
27  
28

U.S.005458004A

United States Patent [19]  
van der Pol

[11] Patent Number: 5,458,004  
[45] Date of Patent: Oct. 17, 1995

[54] VOLUME FLOW METER

[75] Inventor: Ronald van der Pol, Venlo,  
Netherlands

[73] Assignee: Krohne Messtechnik GmbH & Co.  
KG., Germany

[21] Appl. No.: 297,594

[22] Filed: Aug. 30, 1994

[30] Foreign Application Priority Data

Sep. 1, 1993 [DE] Germany 43 29 365.4  
Sep. 8, 1993 [DE] Germany 43 30 363.3

[51] Int. Cl.<sup>6</sup> G01F 1/66

[52] U.S. Cl. 73/861.29; 73/861.31

[58] Field of Search 73/861.28, 861.29,  
73/861.31

3,987,674 10/1976 Baumeol 73/861.28  
4,065,958 1/1978 Krylova et al. 73/861.28  
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5,243,863 9/1993 Gill 73/861.28

Primary Examiner—Richard Chilton  
Assistant Examiner—Elizabeth L. Dougherty  
Attorney, Agent, or Firm—Cesari and McKenna

[57] ABSTRACT

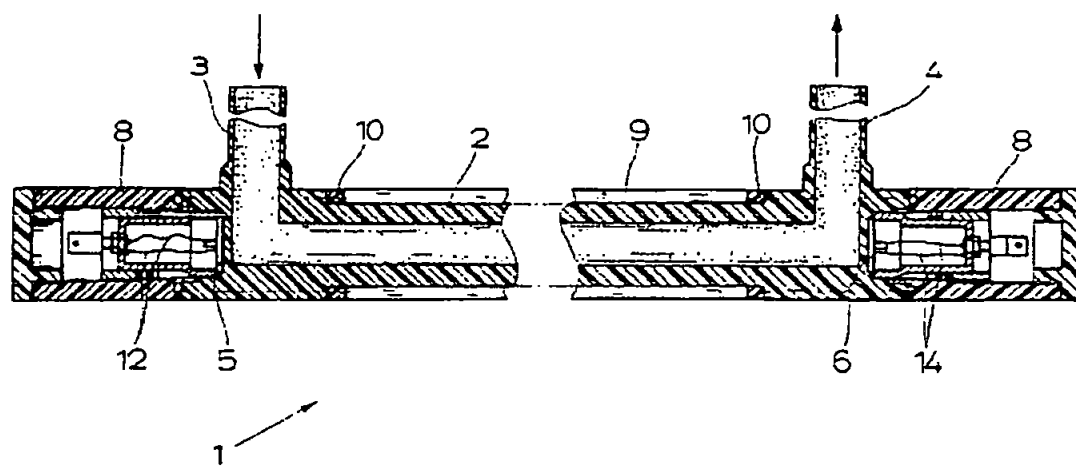
In a volume flow meter with a measuring line, a first measuring head and a second measuring head, the flow volume can be measured more simply and more reliably using evaluation technology by having the measuring line made of a material that transmits an acoustic signal given off by one of the measuring heads at a slower sound velocity than the fluid.

[56] References Cited

U.S. PATENT DOCUMENTS

3,940,985 3/1976 Wyler 73/861.31

6 Claims, 2 Drawing Sheets



DECLARATION OF LAWRENCE C. LYNNWORTH  
IN SUPPORT OF SMC'S MOTION FOR SUMMARY  
JUDGMENT OF INVALIDITY (OBVIOUSNESS)

4. The '004 patent is entitled and is directed to a volume flow meter. The type of flowmeter shown in this patent is often referred to as an ultrasonic flowmeter. The figure shown above (a cross section) illustrates both the prior art and the asserted '004 invention.

5. It is often important in industrial applications to measure the velocity of a fluid. As shown in this figure, fluid enters supply line 3 (upper left) and proceeds through a measuring line 2 (a pipe) and exits through drainage line 4 (upper right). To the left of the pipe is a first measuring head 5 and to the right is a second measuring head 6. Head 5 generates an acoustic (sound) signal which travels through the fluid in the pipe and is detected by head 6 after a certain delay which depends upon the direction and velocity of the fluid, as well as the path length and the speed of sound in the fluid. Head 6 also generates an acoustic signal which is detected in a similar fashion by head 5. From the difference in the travel times of the signals generated and received by (upstream) head 5 and (downstream) head 6, the flow velocity of the fluid in the pipe can be determined. The patent explains that the technique described above is part of the prior art. See the six paragraphs in the BACKGROUND OF THE INVENTION section of the '004 patent at columns 1-2, most of which begin "[i]n the state of the art." See, also, the description of the above figure at col. 3, l. 58 through col. 4, l. 57.

6. The '004 patent is directed to solving a previously known problem for this prior art flowmeter. According to the patent, the signals generated by heads 5 and 6 may also appear in the pipe as an interfering signal since the pipe, if it is made of metal, can create an acoustic short circuit for these signals. These interfering signals prevent an accurate velocity determination since they pass rapidly through this acoustic short circuit and arrive at the detection head 5 or 6 before the corresponding signals which travel through the fluid. See, in particular,

1 the fifth paragraph in the BACKGROUND OF THE INVENTION section at col.  
2 2, ll. 17-35.

3 7. The solution to this problem as set forth in the patent is to make the pipe  
4 of plastic rather than metal since plastic will eliminate the acoustic short circuit as  
5 a source of error. Thus, the figure shown above is the prior art if the pipe is made  
6 of metal and is the '004 invention if the pipe is made of plastic. See, in particular,  
7 col. 2, l. 61 through col. 3, l. 9.

8 8. Although the patent directly refers to the pipe as "plastic" (claim 2) or as  
9 "PFA plastic material" (claim 5), it also refers to the pipe as "made of a material  
10 that transmits an acoustic signal at a slower sound velocity than the fluid transmits  
11 said signal" (claim 1) and "made of PFA plastic material that transmits an acoustic  
12 signal transmitted by one of the measuring heads (5, 6) at a lower sound velocity  
13 than the fluid transmits said signal" (claim 5). See claims 1, 2 and 5 at columns 5-  
14 6.

15 9. Thus, the solution to this known problem as set forth in the patent is to  
16 use a plastic or a PFA plastic pipe rather than a metal pipe (with its undesirable  
17 acoustic short circuit) so that the signal in the pipe (the interfering signal) will  
18 arrive too late to interfere.

19 10. The prior art Urmson patent is also directed to an ultrasonic flowmeter.  
20 Col. 12, ll. 18-53. The Urmson pipe (referred to as a "guide tube") is disclosed as  
21 being made from "a polymeric" (another term for plastic). See claim 11 (col. 30) -  
22 "the material of said guide tube is a polymeric." The material for the guide tube  
23 (pipe) is selected so that it "does not function as an acoustic conductor." See claim  
24 10 (col. 30) - "the guide tube ... is made of a chemically inert generally  
25 mechanically rigid material having a complex molecular structure for converting  
26 sound energy in the material into heat so that sound energy in the material is

1 strongly attenuated and so that the guide tube itself does not function as an acoustic  
2 conductor.”

3 11. The Urmson patent explains (col. 14, ll. 34-43) that it is desirable to  
4 make the guide tube out of plastic because it will prevent the sound traveling  
5 through the guide tube from interfering with the sound traveling through the fluid  
6 being measured - “Additionally, in its preferred form, the guide tube is made of a  
7 polymeric material such as fluorocarbon because such materials attenuate  
8 ultrasonic sound quickly. The use of the herein disclosed acoustic isolation  
9 techniques in combination with sound absorbing materials of construction assures  
10 that the amplitude of the sound conducted through the guide tube material and  
11 reaching the sound receiver is minimal compared to the amplitude of sound  
12 conducted through the fluid sample.”

13 12. From the point of view of achieving the goal of eliminating the acoustic  
14 short circuit as a source of error, there is no difference between slowing the  
15 interfering signal so that it arrives after the signal in the fluid and attenuating the  
16 interfering signal so that it never arrives. In both instances, the interfering signal  
17 no longer interferes. Also, it was known in the prior art that plastic and Teflon  
18 plastic (PFA plastic is part of the Teflon family) have a relatively low sound speed  
19 as compared to metal. “Flow in plastic pipes, including glass fiber reinforced  
20 plastic pipe and Teflon hose, is often easier to measure than in *metal* pipes of the  
21 same dimensions because of the relative absence of acoustic short circuit, and  
22 relatively low sound speed in the plastic pipe ... .” JVASRD at 72.

23 13. Both the Urmson patent and the JVASRD article state that the pipe  
24 should be of a material that does not create an acoustic short circuit. Both suggest  
25 plastic for this purpose. Accordingly, it would have been obvious to one of  
26 ordinary skill in the ultrasonic flowmeter art (at least an engineering degree and  
27 three years of experience in this field) to use a plastic pipe or a PFA plastic pipe in

1 the prior art flowmeter disclosed in the '004 patent to either slow down or  
2 attenuate the interfering signal to avoid the acoustic short circuit of a metal pipe.  
3 Therefore, the subject matter of claims 1, 2 and 5 of the '004 patent would have  
4 been obvious to one of ordinary skill in the ultrasonic flowmeter art.

5 I declare under the penalty of perjury that the foregoing is believed to be true  
6 and correct.

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8 Date:

July 16, 2007

Lawrence C. Lynnworth  
Lawrence C. Lynnworth

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