Sept. 10, 1957 F. SCHMATZ 2,806,217

APPARATUS FOR CLARIFYING BREWER'S WORT

Filed Jan. 6, 1953

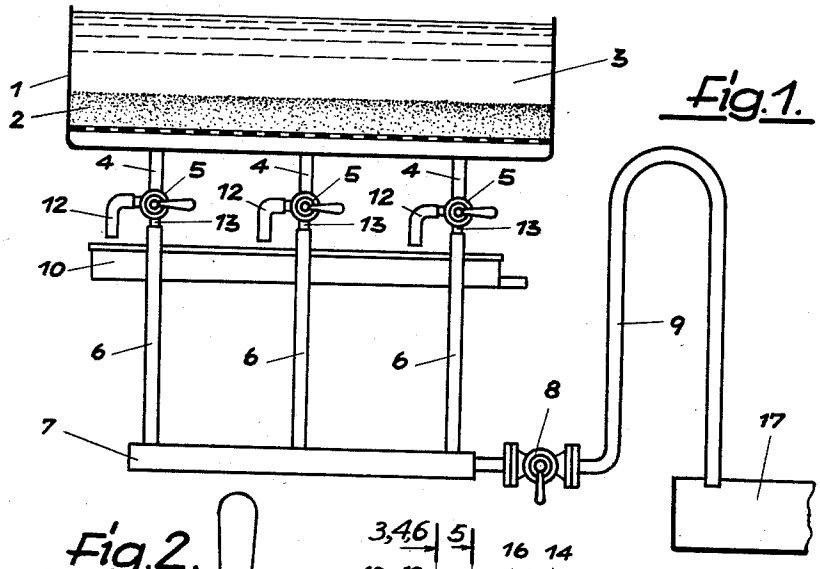


Fig. 1.

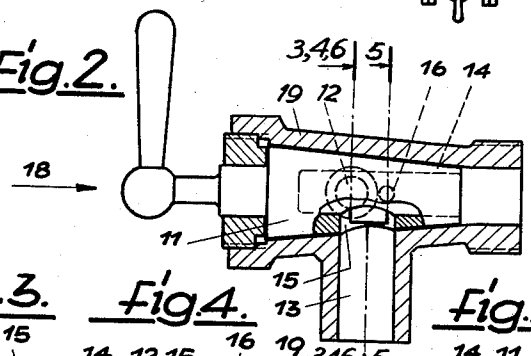


Fig. 2.

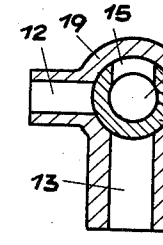


Fig. 3.

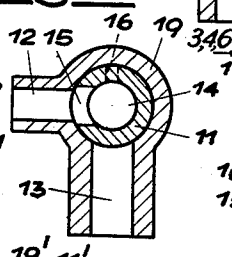


Fig. 4.

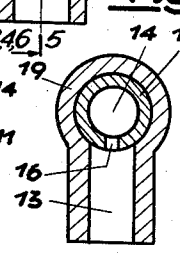


Fig. 5.

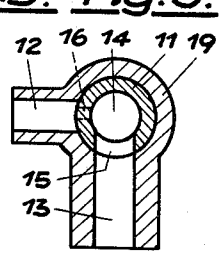


Fig. 6.

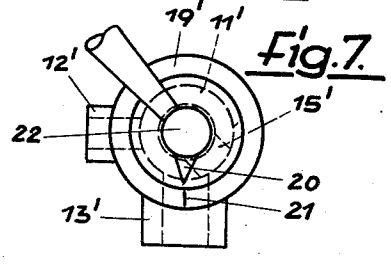


Fig. 7.

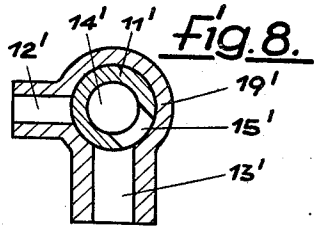


Fig. 8.

INVENTOR

FRIEDRICH SCHMATZ

BY Young, Emery & Thompson

ATTORNEYS

United States Patent Office 2,806,217 Patented Sept. 10, 1957

2,806,217

APPARATUS FOR CLARIFYING BREWER'S WORT

Friedrich Schmatz, Stuttgart, Germany

Application January 6, 1953, Serial No. 329,774

Claims priority, application Germany January 9, 1952

2 Claims. (Cl. 210—254)

This invention relates to an apparatus for clarifying brewer's wort.

Especially this invention refers to a process for clarifying the wort discharged from a straining vat by means of drain pipes communicating with a standpipe, drain taps being provided in the drain pipes substantially under the straining vat.

The clarifying of the wort was hitherto effected so that the wort in the straining vat above the draff was drained initially into a clarifying trough and thereafter into the drain pipes by changing the taps. In this case, however, the wort after changing the straining taps from the clarifying trough to the corresponding drain pipes leading to the standpipe and the wort kettle, will run turbid for some time, because the clear water initially existing in the drain pipes and the standpipe will first rise from the drain pipes into the straining vat on account of the different specific gravities of the wort, on the one hand, and the clear water, on the other hand, which stirs up the draff on entering the straining vat. In this way the clarifying is impeded which is very disadvantageous as seen from the technical art of brewing.

It is an object of the invention to eliminate this disadvantage so that the wort will remain substantially clear after changing the taps from the clarifying trough to the drain pipes.

According to the invention the above is brought about in such a way that at the beginning of the draining of clear wort first a communication with a small clear opening is established between the clarifying vat at the communicating system until clear water runs in the drain pipes and the standpipe is displaced by the wort, and only then the clear opening is enlarged to the full clear opening of the drain pipes.

This process may be carried out in such a way that the clarifying tap is not completely adjusted to the drain pipe when adjusting its passage from the clarifying trough to the drain pipe, so that the clear opening of the passage is reduced in this way. In this operation, however, it is difficult to reduce the clear opening to the necessary degree, that is, the opening will be adjusted too small or too wide. If the clear opening is adjusted too wide, the purpose of the process according to the invention will not be attained, and the wort will become turbid. If the clear opening is adjusted too small, the clear water will be displaced too slowly. Several drain pipes each provided with a tap being usually provided, the clear opening of the passage cannot uniformly be adjusted at will even with the greatest care. If some taps are opened too much and others too little, an undesired turbidness of the wort will occur.

Therefore, in the process according to the invention, a special tap is used. This tap comprises as known per se a tap body having a conical bore and two lateral discharging sockets arranged rectangularly relative to each other, one of the sockets being connected to a drain pipe, the other being connected to a clarifying trough as an outlet with the bore being adapted to communicate

with the straining vat. A tap plug is rotatably arranged in said conical bore and has an axial passage communicating at its one end with the bore of the tap body, and a radial passage communicating with said axial passage and being adapted to be connected alternatively with said two lateral discharging sockets of the tap body when the tap plug is rotated, means being provided for rotating the tap plug within the bore.

According to the invention means are provided for permitting the tap plug to be accurately adjusted to two distinct positions, of which the available cross section of the passage communicating with the axial passage of the tap plug with the lateral discharging socket, being in communication with the drain pipe. The clear opening of the tap is only a minor part of the total cross section of the passage available for the other position.

In one embodiment of the invention the tap is provided with a second radial passage, the cross section of which is substantially smaller than that of the other radial passage, the second radial passage being arranged vertically relative to the other radial passage and displaced in the longitudinal direction.

In a second embodiment of the invention the tap is provided with indicating means on the tap body and on the tap plug or on its rotating means. The indicating means are positioned in such a relation that they are in alignment when only a minor part of the cross section of the radial passage of the plug coincides with a part of the cross section of the lateral discharge socket to communicate with said drain pipe.

The accompanying drawing illustrates the invention by way of example.

Fig. 1 is a diagrammatic view illustrating the clarifying vat with the communicating system,

Fig. 2 is a longitudinal section through a tap body, the tap plug being shown partly in section,

Figs. 3, 4 and 6 are cross sections of the tap shown in Fig. 2 and taken on line 3—3 of Fig. 2 in the direction of the arrows and showing the tap in three different positions,

Fig. 5 is a cross section of the tap taken on 5—5 of Fig. 2 in the direction of the arrows and showing the tap in a fourth position,

Fig. 7 is a side elevation of a second embodiment of a tap, and

Fig. 8 is a cross section of the tap shown in Fig. 7.

In Fig. 1 illustrating the complete system, 1 is the clarifying vat, 2 the deposited draff layer, 3 the wort layer, 4 the broaching pipes, 5 the drain taps, 6 the drain pipes connected to lateral sockets 13 of the drain taps 5 respectively, 7 the collecting pipe, 8 a regulating tap, 9 the standpipe leading to the wort pan 17, and 12 other lateral sockets of the drain taps 5 leading to the clarifying trough 10.

At the beginning of the clarifying process the system consisting of the drain pipes 6, the collecting pipe 7, and the standpipe 9 is filled with clear water to keep the system clean and free from air. As soon as the draff is sufficiently deposited in the clarifying vat, the drain taps 5 are opened to release the passage to the clarifying trough 10. Owing to the suction action the draff layer 2 in the clarifying vat 1 will be more compactly deposited and the outflowing wort filtered. As soon as the wort runs clear, the drain taps 5 are shifted to the drain pipes 6, and at the same time the regulating tap 8 in the system is adjusted so that the desired amount of suction action is obtained during the clarifying process.

In this shifting of the drain taps 5 to the discharge pipes 6 heretofore the outflowing wort became temporarily turbid due to the clear water existing in the system being forced by the heavier wort upward into the clarifying vat

on account of its lower specific gravity, and loosening again the draff already collected.

According to the invention this inconvenience is now remedied by the clear opening of the discharge pipes **6** and the passages of the taps **5** being first kept small, as compared with the total clear opening of the discharge pipes, and being only adjusted to the normal opening after the clear water has been displaced from the system.

Figs. 2 to 6 illustrate in an enlarged scale and by way of example an embodiment of a tap **5** used for this purpose. The tap designed as usual consists of a body **19** and a conical tap plug **11**, the tap body being provided with a lateral discharge socket **12** leading to the clarifying trough **10**, and a drain socket **13** leading to the corresponding drain pipe **6**.

The tap plug **11** is provided with the usual axial passage **14** communicating with the broaching pipe **4** and the clarifying vat **1**, and a radial passage **15** for the outflowing and draining of the wort. Therefore, the radial passage **15** may communicate either with the discharging socket **12** leading to the clarifying trough **10** or with the drain socket **13** leading to the drain pipe **6**.

According to the invention the tap plug **11** is provided with a second radial passage **16** having a substantially smaller cross section than the radial passage **15**, and which is arranged at right angles to the radial passage **15**. Moreover, the smaller radial passage **16** is shifted in axial relation to the radial passage **15** so that the smaller radial passage **16** cannot coincide with the discharge socket **12** leading to the clarifying trough **10**. In this way the larger radial passage **15** is adapted to communicate both with the discharge socket **12** and with the drain socket **13**, but the smaller radial passage **16** can only communicate with the drain socket **13** as shown in Figs. 2 and 5.

Figs. 3, 4, 5, and 6 show several positions of the tap plug of Fig. 2, Fig. 3 showing the tap entirely shut off. In the position of the tap plug according to Fig. 4 there is a communication established between the clarifying vat **1** and the clarifying trough **10**, in the position according to Fig. 5 a communication between the clarifying vat **1** and the system by way of the smaller radial passage **16**, and in the position according to Fig. 6 the same communication by way of the larger radial passage **15**.

The clarifying tap **5** is applied in such a way that, after draining the turbid substance in the tap position according to Fig. 4, the tap plug **11** is shifted to the position according to Fig. 5 by way of the position according to Fig. 3. In the position of Fig. 5, the radial passage **16** of the tap plug **11** is in communication with the drain socket **13** leading to the corresponding drain pipe **6**. The clear water existing in the pipe system cannot now escape upward into the clarifying vat **1** through the proportionately sized radial passage **16** owing to its contracting resistance, but it is drained by way of the communicating system on account of the major specific gravity of the wort. After the clear water has been displaced from the system, the tap plug **11** is shifted to the position according to Fig. 6, so that the larger radial passage **15** communicates with the drain socket **13**, and the entire clear opening of the drain socket **13** is released for the draining of the wort.

It is possible to apply a tap designed differently for the same purpose. It is only essential that this tap permits an adjusting to two different draining amounts.

The process according to the invention can be realized in existing clarifying devices by using another embodiment of a tap. In this case the tap is provided as shown in Fig. 7 with indicating means in such a way that the

tap plug **11'** or the adjusting member **22** provided for its operation has a marking **20** indicating, when in alignment with a marking **21** on the tap body, a position of the tap plug, in which its drain hole **15'** only partially coincides with the drain hole **13'** of the tap body **19'**. In such cases the provision of the tap plug **11'** with a second radial passage may be dispensed with. The other parts of this tap are the same as the parts of the tap according to Figs. 2 to 6, the reference numbers of the embodiment of the tap according to Figs. 7 and 8 being provided with an index such as the lateral socket **12'**, the drain **13'**, the drain **15'** and the tap body **19'**.

What I claim is:

1. Apparatus for clarifying wort comprising a vat having a bottom on which a wort layer is provided, at least one broaching pipe connected at one end to the bottom of the vat, a drain tap comprising a tap body connected to the other end of the broaching pipe and having two lateral sockets and a conical bore communicating with the broaching pipe and the two lateral sockets, a tap plug rotatably arranged in said conical bore and having means whereby it may be rotated within the bore and also having an axial passage communicating at its one end with the bore of the tap body, said tap plug having two radial passages communicating with said axial passage and being adapted to be communicated alternately with said two lateral sockets of the tap body when the tap plug is rotated, a clarifying trough provided adjacent and under one of said lateral sockets, a drain pipe of which one end is connected to the other socket, a collecting pipe into which the other end of the drain pipe terminates, and a standpipe connected to the collecting pipe, one of the radial passages in the tap plug being larger than the other radial passage.

2. Apparatus for clarifying wort comprising a vat having a bottom on which a wort layer is provided, at least one broaching pipe connected at one end to the bottom of the vat, a drain tap comprising a tap body connected to the other end of the broaching pipe and having two lateral sockets and a conical bore communicating with the broaching pipe and the two lateral sockets, a tap plug rotatably arranged in said conical bore and having means whereby it may be rotated within the bore and also having an axial passage communicating at its one end with the bore of the tap body, said tap plug having two radial passages communicating with said axial passage and being adapted to be communicated alternately with said two lateral sockets of the tap body when the tap plug is rotated, a clarifying trough provided adjacent and under one of said lateral sockets, a drain pipe of which one end is connected to the other socket, a collecting pipe into which the other end of the drain pipe terminates, and a standpipe connected to the collecting pipe.

References Cited in the file of this patent

UNITED STATES PATENTS

315,876	Zimmer	Apr. 14, 1885
400,691	Kimball	Apr. 2, 1889
414,673	Bergh	Nov. 12, 1889
629,857	Hoerr	Aug. 1, 1899
978,952	Stanley	Dec. 20, 1910
1,127,822	Sturtevant	Feb. 9, 1915
1,226,106	Miller	May 15, 1917
1,388,523	Noakes	Aug. 23, 1921
1,487,842	Dolenz	Mar. 25, 1924
2,082,222	Siebel	June 1, 1937
2,101,356	Zak	Dec. 7, 1937
2,196,219	Madden	Apr. 9, 1940