
(12) PATENT ABRIDGMENT (11) Document No. AU-B-76682/87
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 609727

(54) Title
PROCESS FOR TANNING FISH SKIN

International Patent Classification(s)
(51)⁴ **C14C 003/00 C14C 003/06 C14C 003/12 C14C 003/30**
C14C 013/00

(21) Application No. : **76682/87** (22) Application Date : **07.08.87**

(43) Publication Date : **09.02.89**

(44) Publication Date of Accepted Application : **09.05.91**

(71) Applicant(s)
CO. GE.IT. S.R.L. COSTRUZIONI GENERALI ITALIANE

(72) Inventor(s)
ANTONIO DEL GAUDIO; FRANCESCO RENZULLI; PIERO RENZULLI

(74) Attorney or Agent
SPRUSON & FERGUSON, GPO Box 3898, SYDNEY NSW 2001

(56) Prior Art Documents
WO 03718/84

(57) Claim

1. A process for tanning fish skin, said process being characterized in that it comprises the steps of:

a) introducing into ~~the~~^a drum-tumbler or any other similar apparatus for the processing of skins, cold water in weight amounts between 1 time and 8 times the weight of the skins to be processed and an amount of salt variable between 2 % and 30 % by weight of the weight of the skins;

b) putting the drum-tumbler in rotation for a time between 2 and 45 minutes;

c) introducing the skins into the drum-tumbler and causing the same to rotate for a time between 5 minutes and 1 hour;

d) introducing into the drum-tumbler an amount between 1 % and 10 % by weight of the skins to be processed of a disinfectant having preservation properties with respect to the skins and which is compatible with the same, and causing the drum-tumbler to rotate for a period variable between 5 minutes and 1 hour;

e) introducing into the drum-tumbler an emulsifying agent in amounts between 0.3 and 5 % by weight of the skins to be processed and causing the drum-tumbler to rotate for a period between 5 minutes and 1 hour;

f) unloading the whole mass from the drum-tumbler;

g) subjecting the skins so treated to an internal cleaning action by removing the flesh residues attached to the same;

(11) AU-B-76682/87

-2-

(10) 609727

- h) weighing the skins so obtained;
- i) introducing the skins into the drum-tumbler together with an amount of water between 0.5 and 6 times the weight of the skins according to the step h) and together with an amount of salt such as to obtain a degree Baumé (B^E) of about 6.5;
- l) putting the drum-tumbler in rotation for a period between 2 and 30 minutes;
- m) introducing formic acid progressively till a pH value is obtained between 3 and 4, and causing the drum-tumbler to rotate further for a period between 10 minutes and 1 hour;
- n) introducing into the drum-tumbler while it is at a standstill an amount of chromium between 3 % and 30 % of the weight of the skins according to step h);
- o) putting the drum-tumbler in rotation for a period between 1 hour and 20 hours;
- p) keeping the whole mass at rest ~~about~~ overnight;
- q) washing with running water; and
- r) arranging the skins so tanned on a beam or any other similar device at rest for at least 36 hours.

S & F Ref: 33577

FORM 10

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

60 9727

(ORIGINAL)

FOR OFFICE USE:

Class Int Class

Complete Specification Lodged:
Accepted:
Published:

This document contains the
amended specification under
Section 10 and is correct for
printing

Priority:

Related Art:

Name and Address
of Applicant:

Co.Ge.It. S.R.L. Costruzioni Generali Italiane
315 Via Argine
80147 Napoli
ITALY

Address for Service: Spruson & Ferguson, Patent Attorneys
Level 33 St Martins Tower, 31 Market Street
Sydney, New South Wales, 2000, Australia

Complete Specification for the invention entitled:

Process for Tanning Fish Skin

The following statement is a full description of this invention, including the
best method of performing it known to me/us

ABSTRACT

A process for tanning fish skin, which process comprises the steps of:

a) introducing into the drum-tumbler or any other similar apparatus for the processing of skins, cold water in weight amounts variable between one time and eight times the weight amount of skins to be processed and an amount of salt variable between 2 % and 30 % by weight of the weight of skins;

b) putting said drum-tumbler into rotation for a time period variable between 2 and 45 minutes;

10 c) introducing the skins into said drum-tumbler and let the drum to rotate for a period variable between 5 minutes and one hour;

d) introducing into the drum-tumbler an amount variable between 1 % and 10 % by weight of the skins to be processed of a disinfectant having preservation properties with regards to said skins and which is compatible with the same, and causing the drum to rotate for a period variable between 5 minutes and one hour;

e) introducing into the drum-tumbler an emulsifying agent in amounts 0.3 and 5 % by weight of the skins to be processed and causing the drum to rotate for a period variable between 5 minutes and one hour;

20 f) unloading the whole amount from said drum-tumbler;

g) subjecting the skins so treated to an internal cleaning action with removal of the flesh residues attached to the skins;

h) weighing the skins so obtained;

i) introducing the skins into the drum-tumbler together with an amount of water between 0.5 and 6 times as large as the weight of the skins according to the step h) and with an amount of salt such as to obtain a degree Baumé (B^E) of about 6.5;

30 l) putting the drum into rotation for a period variable between 2 and 30 minutes;

m) introducing formic acid progressively till a pH value is obtained between 3 and 4, and causing the drum to rotate further for a period variable between 10 minutes and one hour;

n) introducing into the drum-tumbler while it is at a standstill an amount of chromium variable between 3 and 30 % by weight of the skins according to the step h);

o) causing the drum-tumbler to rotate for a time variable between 1 hour and 20 hours;

- p) keeping the whole mass at rest about overnight;
- q) washing the same with running water; and
- r) arranging the skins so tanned on a beam or the like at rest for at least 36 hours.

DISCLOSURE OF THE INVENTION

The present invention relates to a process for tanning fish skin. More particularly, the present invention relates to a process which allows tanned fish skin to be obtained having optimal characteristics as regards workability and finishing so that finished products can be made from the same which are perfect from a commercial standpoint.

It is well known that the trade of skin articles such as shoes, bags, wallets and the like is ever increasing and is addressing to a definitely large and industrial market.

10 Various different types of animal skins are tanned at the present time on an industrial scale, such as for instance skins of lizards, crocodiles, and a lot of others. The major problems that cause the production costs to increase and accordingly which cause the retail prices to increase also, consist more particularly in difficulties involved in the obtainment of raw material.

Moreover, in a number of cases the industrial effort tries to find out new kinds of proposals for customers so as to succeed in acquiring additional market possibilities. As regards this attitude, the competition is increasingly keen and the articles available at the present time do not
20 give many possibilities of changing the production.

It is quite clear from the above that it is very important to have at one's disposal a process for tanning fish skin like that according to the present invention, which allows a skin to be exploited as raw material which is available at definitely lower prices with respect to the skins employed at the present time, such as for instance lizard, reptile or crocodile skins

In addition, the process according to the present invention allows the skin to be exploited of animals caught for food purposes, so as to avoid killing animals to the only aim of obtaining their skins.

30 Moreover, tanned fish skin is characterized by typical ornamental motifs which, being new with respect to the motifs of the skins processed at the present time can be advantageously exploited for advertisement purposes.

Accordingly, it is an object of the present invention that of supplying a fundamental technical teaching for the realization of a process for tanning skin of fish of any kind, and in particular of fish typical of northern seas because of their strength.

Skin tanned with the process of the present invention can be both the fresh type and of the type preserved in the wet state and pickled.

Accordingly, it is a specific object of the present invention a process for tanning fish skin, said process comprising the steps of:

10 a) introducing into the drum-tumbler or any other similar apparatus for the processing of skins, cold water in weight amounts variable between 1 time and 8 times the weight amount of the skins to be processed and an amount of salt variable in weight between 2 % and 30 % of the weight of said skins;

b) causing the drum-tumbler to rotate for a time period variable between 2 and 45 minutes;

c) introducing the skins into the drum-tumbler and causing the drum to rotate for a period variable between 5 minutes and 1 hour;

20 d) introducing into the drum-tumbler an amount variable between 1 % and 10 % by weight of the skins to be processed of a disinfectant having preservation properties with respect to said skins and which is compatible with the same, and causing the drum-tumbler to rotate for a period variable between 5 minutes and one hour;

e) introducing into the drum-tumbler an emulsifying agent in amounts between 0.3 and 5 % by weight of the skins to be processed, and causing said drum to rotate for a period variable between 5 minutes and 1 hour;

f) unloading the whole mass from the drum-tumbler;

30 g) subjecting the skins so treated to an internal cleaning action so as to remove the flesh residues attached to the same;

h) weighing the skins so obtained;

i) introducing the skins into the drum-tumbler together with an amount of water between 0.5 and 6 times the weight amount of the skins according to the step h) and with an amount of salt such as to obtain a degree Baumé (B^E) of about 6.5;

l) putting the drum-tumbler into rotation for a period variable between 2 and 30 minutes;

m) introducing formic acid progressively till a pH value is obtained between 3 and 4, and causing the drum to rotate further for a period between 10 minutes and 1 hour;

n) introducing into the drum-tumbler while it is at a standstill an amount of chromium between 3 and 30 % by weight of the skins according to the step h);

5 o) putting the drum-tumbler into rotation for a period variable between 1 hour and 20 hours;

p) keeping the whole mass at rest overnight;

q) washing with running water; and

r) arranging the skins so tanned on a beam at rest or on any other similar device for at least 36 hours.

10 According to a first embodiment of this invention there is provided a process for tanning fish skin, said process being characterized in that it comprises the steps of:

15 a) introducing into a drum-tumbler or any other similar apparatus for the processing of skins, cold water in weight amounts between 1 time and 8 times the weight of the skins to be processed and an amount of salt variable between 2 % and 30 % by weight of the weight of the skins;

b) putting the drum-tumbler in rotation for a time between 2 and 45 minutes;

20 c) introducing the skins into the drum-tumbler and causing the same to rotate for a time between 5 minutes and 1 hour;

d) introducing into the drum-tumbler an amount between 1 % and 10 % by weight of the skins to be processed of a disinfectant having preservation properties with respect to the skins and which is compatible with the same, and causing the drum-tumbler to rotate for a period variable between 5 minutes and 1 hour;

25 e) introducing into the drum-tumbler an emulsifying agent in amounts between 0.3 and 5 % by weight of the skins to be processed and causing the drum-tumbler to rotate for a period between 5 minutes and 1 hour;

30 f) unloading the whole mass from the drum-tumbler;

g) subjecting the skins so treated to internal cleaning action by removing the flesh residues attached to the same;

h) weighing the skins so obtained;

35 i) introducing the skins into the drum-tumbler together with an amount of water between 0.5 and 6 times the weight of the skins according to the step h) and together with an amount of salt such as to obtain a degree Baumé (B^E) of about 6.5;



1) putting the drum-tumbler in rotation for a period between 2 and 30 minutes;

m) introducing formic acid progressively till a pH value is obtained between 3 and 4, and causing the drum-tumbler to rotate further for a period between 10 minutes and 1 hour;

n) introducing into the drum-tumbler while it is at a standstill an amount of chromium between 3 % and 30 % of the weight of the skins according to step h);

o) putting the drum-tumbler in rotation for a period between 1 hour and 20 hours;

p) keeping the whole mass at rest overnight;

q) washing with running water; and

r) arranging the skins so tanned on a beam or any other similar device at rest for at least 36 hours.

Thus an optimal product has been obtained which is very suitable for being subjected to the usual retanning treatments in the expected periods.

Preferably according to the present invention after step p) a further rotation can be carried out for a period of about 30 minutes.

Again according to the present invention, said step a) is performed with a water amount at a temperature lower than 10°C which is four times as large as the weight of the skins to be processed, whereas the amount of salt employed in said step is preferably 10 % by weight of said skins.

The rotation time of the step b) is preferably, in the process according to the present invention, of 10 minutes, whereas the rotation of the drum-tumbler according to the step c) of the same process is carried out preferably for 15 minutes.

Further according to the present invention, the disinfectant introduced into the drum-tumbler according to step d) is about 3.5 % by weight of the skins and the drum-tumbler is caused to rotate preferably for a period of 15 minutes.

More particularly, said disinfectant can be the same as that commercially available under the names of SOLANA S or IMEROLO SJ.

In addition, the emulsifying agent introduced according to the step e) is supplied in amounts of 1 % by weight of the skins to be processed and the drum-tumbler is made to rotate preferably for a time of 15 minutes in order to complete step e).



Again according to the present invention, the cleaning action performed on the skins so treated and unloaded after step g) can be carried out by fleshing, by hanging on nails and by shaving or pressing and shaving.

- Step i) of the process according to the present invention can be
- 5 performed advantageously with water at a temperature lower than 10°C and in amounts of 2.5 times the weight amount of the skins according to step h) and with an amount of salt of 15 % by weight of the skins.



Moreover, said step l) in which the drum-tumbler is made to rotate can be performed for a period of 10 minutes.

the progressive introduction of formic acid can be carried out according to the present invention till a pH value is obtained of 3.5 and step m) can comprise preferably a 30 minutes rotation.

Further according to the present invention, chromium introduced in step n) can be of the self-alkalizing type (for instance, the product commercially available under the name of BAICROM F) in amounts of 15 % by weight of the skins according to step h).

10 In addition, the rotation of step o) can occur for a period of 8 hours.

The rest period of the skins tanned by means of the process according to the present invention can be preferably of 48 hours.

With the process according to the present invention, tanned fish skins are obtained which are ready for being subjected to retanning and dyeing treatments.

More particularly, a process is suggested according to the present invention of retanning and dyeing of fish skins obtained through the process of the present invention, by which retanning and dyeing procedure a
20 finished product can be obtained that is ready for the refinish procedure and has optimal features, considering that it is possible to treat the products obtained through said procedure by means of the usual retanning and dyeing treatments so as to obtain equally good quality skins that are ready for the refinish treatment.

Moreover, it is also an object of the present invention a retanning treatment of fish skins obtained through the procedure disclosed above, which treatment comprises the step of:

30 1) blubbering the skins in water at a temperature between 20°C and 50°C in amounts of 0.5-8 times as large as the weight of the skins according to step h) of the process, with a blubbering agent in amounts between 0.5 and 10 % by weight of skins according to step h), causing the drum-tumbler to rotate for a period variable between 10 minutes and 2 hours;

2) unloading the drum-tumbler by taking out the liquid and leaving the skins behind;

3) introducing into the drum-tumbler a water amount of 0.5-8 times the weight amount of the skins according to step h), at a temperature between 20°C and 60°C, and adding an amount between 0.5 and 10 % by weight of said skins of a neutralizing agent and making the drum-tumbler to rotate for a time between 5 minutes and 2 hours;

4) adding an amount of a product of a tannin-base vegetable origin in amounts between 1 and 10 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a time variable between 10 minutes and 1 hour;

5 5) unloading the bath;

6) washing the skins in running water for a time variable between 5 and 10 minutes and unloading the bath;

7) padding or stuffing the skins so obtained by introducing a water amount at a temperature between 20°C and 80°C, said amount being variable between 1.5 and 8 times the weight amount of the skins according to step h), and with an amount variable between 1.5 and 30 % of said weight of the skins of a softening agent;

8) causing the whole mass to rotate for a period between 5 minutes and 2 hours;

15 9) carrying out a vegetable retanning by adding an amount variable between 2 % and 50 % by weight of the skins according to step h) of the process, of a tannin-base vegetable product and causing the drum-tumbler to rotate for a period variable between 5 minutes and 2 hours.

At that point the skins so obtained are completely finished so that the bath can be unloaded and the dyeing treatment can be performed next or otherwise the dyeing treatment can be carried out in the bath itself without unloading the same.

Preferably, the dyeing process is carried out through the following steps:

25 10) adding dyes to the bath;

11) adding formic acid in amounts variable between 0.5 and 10 % by weight of said weight of the skins and causing the drum-tumbler to rotate for a time variable between 10 minutes and 2 hours;

12) unloading the bath.

30 According to a second embodiment of this invention there is provided a retanning treatment of fish skins obtained by means of the process of the first embodiment, said retanning treatment being characterized in that it comprises the steps of:

35 1) blubbering the skins in water at a temperature between 20°C and 50°C in amounts between 0.5 and 8 times the weight amount of the skins according to step h) of the process, introducing a blubbering agent in amounts variable between 0.5 and 10 % by weight of the skins according to



step h) and causing the drum-tumbler to rotate for a period variable between 10 minutes and 2 hours;

2) unloading said drum-tumbler taking the liquid out of the same and leaving the skins behind;

5 3) introducing into the drum-tumbler a water amount between 0.5 and 8 times as large as the weight of the skins according to step h) and having a temperature between 20°C and 60°C, adding an amount variable between 0.5 and 10 % by weight of said skins according to step h) of a neutralizing agent and causing the drum-tumbler to rotate for a period variable between
10 5 minutes and 2 hours;

4) adding an amount of tannin-base vegetable origin product variable between 1 and 10 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a period variable between 10 minutes and 1 hour;

15 5) unloading the bath;

6) washing the skins with running water for a period between 5 minutes and 10 minutes and unloading the bath;

7) blubbering the skins so obtained introducing water at a temperature between 20°C and 80°C in amounts between 1.5 and 8 times as
20 large as the weight of the skins according to step h) and an amount between 1.5 and 30 % by weight of the skins according to step h) of a softening agent;

8) causing the drum-tumbler to rotate for a period between 5 minutes and 2 hours;

25 9) retanning the material by means of a vegetable retanning process through the addition of an amount of tannin-base vegetable product between 2 % by weight and 50 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a period between 5 minutes and 2 hours.

30 Preferably according to the present invention the blubbering of the skins according to the present invention can be performed with water at a temperature of 35°C, water being present in amounts twice as large as said weight, and with an amount of the blubbering agent equal to 2 % of that weight, and causing the drum-tumbler to rotate for 40 minutes.

35 Again according to the present invention, step 3) of the retanning process can be carried out with water at 40°C in amounts twice as large as the weight of the skins according to step h) and with an amount of the neutralizing agent equal to 2 % of the same weight, and causing the drum-



tumbler to rotate for 20 minutes.

In addition, the tannin-base product can be added according to step 4) in amounts of 5 % by weight and the rotation can be performed for 40 minutes, said product being for instance the TAMOL GA.

5 Further according to the present invention the padding or stuffing operation of the skin can be carried out within amounts of water at 55°C three times as large as the weight of the skins as defined above and employing an amount of 8 % by weight of the softening agent. Said softener can be made up of 5 % of GLICERMAX 52 and 3 % of SERIDOL 82.

10 The first of said products acts as a softening agent whereas the second one avoids the fact that the so-called "grain" or the top part of the skin itself be affected too much by the action of the first product.

The rotation for realizing the blubbering step may last by preference 30 minutes.

15 The vegetable retanning according to step 9) can be carried out by adding preferably an amount of the vegetable product equal to 13 % of the weight of the skins as defined above and causing the drum-tumbler to rotate for 30 minutes.

20 More particularly the retanning can be performed by adding 5 % by weight of TAMOL GA and 8 % by weight of TANIGAN OS.

In the dyeing step formic acid can be preferably added in amounts equal to 2 % by weight of the skins according to step h) causing the drum-tumbler to rotate for about 40 minutes.

25 At that point the product is completely finished and it is ready for being subjected to the usual refinish operations.

30 The present invention has been disclosed with a particular reference to some specific embodiments of the same but it is to be understood that modifications and changes can be introduced by those who are skilled in the art without departing from the spirit and scope of the invention for which a priority right is claimed.

35 Baicrom F is chromium basic sulfate. Tamol is a chromic tanning agent. Glicermax 52 and Seridol 82 are lubricating oils. Tanigan OS is methylene linkage condensate of hydroxides and arylsulphonic acids, it is a vegetable product. Imerolo SJ is ethylene oxide derivatives combined with solvents having the function of detergent, soaking and degreasing. Solana S is a non-ionic compound made up of emulsifying agents and solvents having the same functions of the above compounds.



The claims defining the invention are as follows:

1. A process for tanning fish skin, said process being characterized in that it comprises the steps of:

a) introducing into ~~the~~^a drum-tumbler or any other similar apparatus for the processing of skins, cold water in weight amounts between 1 time and 8 times the weight of the skins to be processed and an amount of salt variable between 2 % and 30 % by weight of the weight of the skins;

b) putting the drum-tumbler in rotation for a time between 2 and 45 minutes;

c) introducing the skins into the drum-tumbler and causing the same to rotate for a time between 5 minutes and 1 hour;

d) introducing into the drum-tumbler an amount between 1 % and 10 % by weight of the skins to be processed of a disinfectant having preservation properties with respect to the skins and which is compatible with the same, and causing the drum-tumbler to rotate for a period variable between 5 minutes and 1 hour;

e) introducing into the drum-tumbler an emulsifying agent in amounts between 0.3 and 5 % by weight of the skins to be processed and causing the drum-tumbler to rotate for a period between 5 minutes and 1 hour;

f) unloading the whole mass from the drum-tumbler;

g) subjecting the skins so treated to an internal cleaning action by removing the flesh residues attached to the same;

h) weighing the skins so obtained;

i) introducing the skins into the drum-tumbler together with an amount of water between 0.5 and 6 times the weight of the skins according to the step h) and together with an amount of salt such as to obtain a degree Baumé (B^E) of about 6.5;

l) putting the drum-tumbler in rotation for a period between 2 and 30 minutes;

m) introducing formic acid progressively till a pH value is obtained between 3 and 4, and causing the drum-tumbler to rotate further for a period between 10 minutes and 1 hour;

n) introducing into the drum-tumbler while it is at a standstill an amount of chromium between 3 % and 30 % of the weight of the skins according to step h);

o) putting the drum-tumbler in rotation for a period between 1 hour and 20 hours;

p) keeping the whole mass at rest ~~about~~ overnight;



- q) washing with running water; and
- r) arranging the skins so tanned on a beam or any other similar device at rest for at least 36 hours.
2. A process according to claim 1, characterized in that after step p) a rotation of the drum-tumbler is performed for a period of about 30 minutes.
3. A process according to claim 1, characterized in that said step a) is carried out by introducing water at a temperature of 10°C in amounts of 4 times the weight amount of the skins to be processed and an amount of salt of 10 % by weight of the skins.
4. A process according to claim 1, characterized in that the rotation according to step b) is performed for 10 minutes.
5. A process according to claim 1, characterized in that the rotation according to step c) is carried out for 15 minutes.
6. A process according to claim 1 characterized in that step d) is carried out by introducing an amount of a disinfectant equal to 3.5 % by weight of the skins and by rotating the drum-tumbler for 15 minutes.
7. A process according to claim 1 or 6, characterized in that said disinfectant is SOLANA S or IMEROLO SJ.
8. A process according to claim 1, characterized in that said step e) is performed by introducing an amount of the emulsifying agent equal to 1 % by weight of the skins to be processed and causing the drum-tumbler to rotate for about 15 minutes.
9. A process according to claim 1, characterized in that the cleaning action according to step g) is carried out through the operations of fleshing, hanging on nails and shaving or pressing and shaving.
10. A process according to claim 1 characterized in that step i) is carried out by introducing into the drum-tumbler, together with said skins, also an amount of water at a temperature lower than 10°C, equal to 2.5 times the weight of the skins according to the step h) and an amount of salt equal to 15 % by weight according to step h).
11. A process according to claim 1, characterized in that the rotation according to step l) is carried out for about 10 minutes.
12. A process according to claim 1 characterized in that step m) is carried out through the introduction of formic acid in amounts equal to those that are required to obtain a pH value of the bath of 3.5, and causing the drum-tumbler to rotate for 30 minutes.

13. A process according to claim 1, characterized in that step n) is carried out through the introduction of an amount of chromium equal to 15 % by weight of the skins according to step h).

14. A process according to claim 1 or 13, characterized in that said chromium is of the self-alkalizing type.

15. A process according to claim 14, characterized in that said self-alkalizing chromium is BAICROM F.

16. A process according to claim 1, characterized in that the rotation of the drum-tumbler according to step o) is performed for a time of 8 hours.

17. A process according to claim 1, characterized in that the rest period according to step r) lasts 48 hours.

18. A retanning treatment of fish skins obtained by means of the process according to any one of claims 1 to 17, said retanning treatment being characterized in that it comprises the steps of:

1) blubbering the skins in water at a temperature between 20°C and 50°C in amounts between 0.5 and 8 times the weight amount of the skins according to step h) of the process, introducing a blubbering agent in amounts variable between 0.5 and 10 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a period variable between 10 minutes and 2 hours;

2) unloading said drum-tumbler taking the liquid out of the same and leaving the skins behind;

3) introducing into the drum-tumbler a water amount between 0.5 and 8 times as large as the weight of the skins according to step h) and having a temperature between 20°C and 60°C, adding an amount variable between 0.5 and 10 % by weight of said skins according to step h) of a neutralizing agent and causing the drum-tumbler to rotate for a period variable between 5 minutes and 2 hours;

4) adding an amount of tannin-base vegetable origin product variable between 1 and 10 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a period variable between 10 minutes and 1 hour;

5) unloading the bath;

6) washing the skins with running water for a period between 5 minutes and 10 minutes and unloading the bath;

7) blubbering the skins so obtained introducing water at a temperature between 20°C and 80°C in amounts between 1.5 and 8 times as

large as the weight of the skins according to step h) and an amount between 1.5 and 30 % by weight of the skins according to step h) of a softening agent;

8) causing the drum-tumbler to rotate for a period between 5 minutes and 2 hours;

9) retanning the material by means of a vegetable retanning process through the addition of an amount of a tannin-base vegetable product between 2 % by weight and 50 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a period between 5 minutes and 2 hours.

19. A treatment according to claim 18, characterized in that the blubbering step 1) is performed with water at a temperature of 35°C and in amounts twice as large as the weight amount of said skins and with an amount of the blubbering agent equal to 2 % of the same weight of the skins, causing the drum-tumbler to rotate for 40 minutes.

20. A treatment according to claim 18, characterized in that step 3) is carried out by the introduction of water at 40°C in amounts twice as large as the weight amount of the skins according to step h) and of an amount of a neutralizing agent equal to 2 % of the same weight, and causing the drum-tumbler to rotate for 20 minutes.

21. A treatment according to claim 18, characterized in that step 4) is performed by the addition of an amount of 5 % by weight of the skins according to step h) of the tannin-base vegetable origin product and causing the drum-tumbler to rotate for 40 minutes.

22. A treatment according to claims 18 or 21, characterized in that said tannin-base vegetable origin product is TAMOL GA.

23. A treatment according to claim 18, characterized in that step 7) is performed through the introduction into said drum-tumbler of an amount of water at 55°C three times as large as the weight amount of the skins according to step h) and of an amount of the softener equal to 8 % by weight of the skins themselves.

24. A treatment according to claims 18 or 23, characterized in that said softener is made up of a mixture of GLICERMAX 52 and SERIDOL 82.

25. A treatment according to claim 24 characterized in that an amount of GLICERMAX 52 is supplied which is 5 % by weight of the weight amount of the skins according to step h) as well as an amount of SERIDOL 82 is supplied which is 3 % by weight of the weight amount of said skins.

26. A treatment according to claim 18 or 23 characterized in that the rotation according to step 8) is carried out for a period of 30 minutes.

27. A treatment according to claim 18, characterized in that step 9) is performed through the addition of a tannin-base vegetable origin product in amounts equal to 13 % by weight of the weight amount of the skins according to step h) and causing the drum-tumbler to rotate for 30 minutes.

28. A treatment according to claim 18 or 27, characterized in that said tannin-base vegetable origin product is made up of a mixture of TAMOL GA and TANIGAN OS.

29. A treatment according to claim 28, characterized in that an amount of TAMOL GA is present equal to 5 % by weight of the skins according to step h) and an amount is also present of TANIGAN OS equal to 8 % of said weight.

30. A treatment according to one of claims 18 to 29, characterized in that a dyeing process is carried out after step 9), said dyeing process comprises the steps of:

10) adding the dyeing agents into the bath;

11) adding formic acid in amounts variable between 0.5 and 10 % by weight of the skins according to step h) and causing the drum-tumbler to rotate for a time between 10 minutes and 2 hours; and

12) unloading the bath from the drum.

31. A treatment according to claim 30, characterized in that step 12) is performed introducing an amount of formic acid of 2 % by weight of the weight amount of skins according to step h) and causing the drum-tumbler to rotate for 40 minutes.

32. A process for tanning fish skin according to any one of claims 1 to 17, substantially as herein described.

33. Fish skin whenever tanned by the process of any one of claims 1 to 17.

34. Fish skin whenever retanned by the treatment of any one of claims 18 to 31.

DATED this THIRTY-FIRST day of JANUARY 1991
Co.Ge.It. S.R.L. Costruzioni Generali Italiane

Patent Attorneys for the Applicant
SPRUSON & FERGUSON

