(57) **Abstract:**
The present process permits a method of determining the species of a raw log based on its bark type. The image of the bark is manipulated to fit into a known bark pattern for a certain species. The image of the raw log bark is taken by some type of camera/video/scanner. The image of the raw log bark is manipulated to fit into many known bark patterns already stored in a Computer. The pattern that most closely resembles the raw log bark by taking the least amount of manipulation is the decided species of the raw log. The pattern resemblance is based on a varying degree of certain identifying features for all bark (for example cracks, pits, flakes, crevices, etc).
ABSTRACT OF THE DISCLOSURE

The present process permits a method of determining the species of a raw log based on its bark type. The image of the bark is manipulated to fit into a known bark pattern for a certain species. The image of the raw log bark is taken by some type of camera/video/scanner. The image of the raw log bark is manipulated to fit into many known bark patterns already stored in a Computer. The pattern that most closely resembles the raw log bark by taking the least amount of manipulation is the decided species of the raw log. The pattern resemblance is based on a varying degree of certain identifying features for all bark (for example cracks, pits, flakes, crevices, etc).
METHOD FOR THE IDENTIFICATION OF RAW LOG SPECIES

The present process relates to a method of determining the species of a raw log. To date there has been no viable method of performing this function through automation. With the use of the method concerned with in this patent, this is now possible.

The method comprises using a suitable device to take pictures of the bark on a raw log. The species is determined by utilizing a mathematical formula and/or comparing the bark picture to numerous templates of different species of bark of all types and ages. This database of tree bark from different species of all numerous types and ages is used as a comparison for the raw logs being scanned.

The process as exemplified in a practical arrangement as it could apply in the manufacturing of wood products.

Figure 1 is a side view of how the devices may be arranged for a practical use.

Referring to Figure 1, the process comprises of a log sample 2 traveling on a chain way 1 or some other means of transferring the sample. This sample moves in a manner such that this said log is first brought into the sensing region of the triggering device 3. This triggering device is used to determine the start and end of the log.

The next step is for the wood sample to transfer into the optical device 4 sensing window/region and the device will take one/many snapshots/video(s) of the log(bark). Or it
could take a continual video of a part or of the whole length of the log(bark). The snapshots and/or videos of the log(bark) is sent to a computer and/or controller 5.

The snapshots and/or videos of the log(bark) data is then adjusted and manipulated through mathematical formulas and/or data base comparisons. This final value is then used to determine the species of the log(bark) sample.

The log is now identified as to its species and is marked in such a way (eg. Spray the ends of the log with an identifying color) which will show up on the different wood products that are processed from this log through a variety of machine cut centers. The identifying mark can then be scanned and recognized by the appropriate devices set up at each machine cut center. Now each machine cut center can cut the product that is best suited and most efficient for the species being processed.

Figure 2 is a view of a mobile equipment.

Referring to Figure 2, the process comprises of a type of mobile equipment 1 eg. Processor, cherry picker, button-top, etc. With a log sample 2 being cut, and/or stacked, and/or processed according to it’s species. This sample is in the sensing region of the triggering device 3. This triggering device is used to determine that the sample is present.

The next step is for the wood sample to have snapshot(s)/video(s) taken of the sample by the optical device 4. The snapshot(s)/video(s) of the log(bark) is sent to a computer and/or controller 5. Which could be situated in the cab of the mobile equipment.
The snapshots and/or videos of the log(bark) data is then adjusted and manipulated through mathematical formulas and/or data base comparisons. This final value is then used to determine the species of the log(bark) sample.
BACKGROUND

To be able to determine the species of a raw log before the first machine center in a process plant would enable the log to be cut/used in the most efficient way according to the cut/use options of each individual species. Once the species is identified for a raw log, than it can be easily marked to be identified at each machine center or operator station so the best cut/use decision can be made.

In addition, ever since the first piece of wood was processed there has been a substantial problem with excessive wood breakage during the finishing of wood products due in no small part to the over drying of the wood. This is the direct result of not being able to separate all wood species and dry them accordingly. Each species of wood dries at a different rate and actually stores the water differently within the fibers of the wood due to the different densities and constitution of the wood fibers.

In addition, there is the problem of not properly drying the wood to the proper level and therefore resulting in severe warping of boards rendering them either useless or requiring excessive trimming which once again results in large quantities of wasted wood product.

In the past there has been little concern given to the efficiency with which wood has been processed but today with the awareness of the state of our current timber supply it has become apparent that this incredible waste of our wood resource is no longer acceptable and any
measures which can reduce the degree of waste wood are not an option but a requirement for the responsible management of our forests.

In addition to the above benefits of being able to reliably determine the species of the wood being processed, there is also the benefit of being able to process the different species simultaneously and cut the individual species to varying dimensions based on the market requirements for the individual species. This is impossible through automation and extremely difficult with the use of human input based on visual analysis at the present time and therefore manufacturers tend to process individual species one at a time which makes it difficult to satisfy more than one market requirement at a time. With the use of the method in this patent this is now possible, giving any manufacturer who utilizes this method an edge in the world market.
THE EMBODIMENTS OF THE PROCESS IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A method for the identification of the species of a raw log, the method comprising:

A method where an optical device(s) eg. Camera(s), Scanner(s), etc. is used to scan or take a snapshot or a video, after being triggered to do so, of the bark of a raw log to determine the species of the said raw log. This captured image is then utilized to determine the species of the said raw log by identifying species specific, physical characteristics of the bark. This is done by a computer database of templates to compare the sample bark pattern to. The sample bark pattern is manipulated in some fashion such as image warping, morphing, or bit shifting to make the sample bark pattern fit into the various species templates contained in the database. The bark pattern contained in the database which required the least amount of manipulation to match would, by probability, be determined to be the most likely species of the said raw log bark sample.

2. The process of claim 1 comprising the use of any suitable type of scanner, whether it be a mechanical, optical, ultrasound, xray, or any suitable type of device capable of creating/capturing/delivering an image or image representation of the raw log bark.

3. The process in claim 1 comprising the use of any suitable device to trigger the bark reading device to start scanning, videoing, taking snapshots or, in any suitable manner, capturing an image of the raw log bark.
4. The process in claim 1 allowing for the possibility of not requiring the use of a separate triggering device.

5. The process of claim 1 where the image of the raw log bark is then utilized in some fashion, whether it be by mathematical formula, database comparison, image manipulation, or any suitable means of utilizing the captured bark image data of the said raw log sample, to determine the species of the raw log.

6. The process of claims 1, 2, 3, 4, and 5 being applied to any mobile equipment that may handle or process the raw log at any time. Example: from the tree standing in the forest to it being cut down, hauled away, stockpiled, or loaded into some sort of wood processing plant.