AGRICULTURE

Tobacco Stems Usable After Machine Treatment

➤ A MACHINE treatment that makes tobacco stems usable without stripping them out of the leaves is the subject of patent 2,344,106, obtained by Charles L. Reed of Richmond, Va., and assigned by him to Larus & Brother Company, also of Richmond.

It is the usual practice to cut the two halves of the tobacco leaf away from the midrib (called "stem" in the trade), which is subsequently treated and utilized separately. This increases the labor involved, and hence the costs. Softening treatments could not be applied to the whole structure, because they would ruin the leaf while modifying the stem.

In the new method, the stem is clamped in a narrow chamber, with practically the whole of the leaf extending outside. The treating fluids or gases are then applied to the stem, under pressure, and when the treatment is completed, leaf, stem and all are sufficiently uniform in texture to permit their use together.

Science News Letter, March 25, 1944

MATHEMATICS

Ovals Should Be Used To Map Airplane Ranges

➤ NOT CONCENTRIC circles, but complicated ovals, or even curves running off the paper, should be used to correctly map on a flat surface airplane ranges of 500, 1,000, and 1,500 miles or more, Prof. Edward Kasner of Columbia University and Prof. John De Cicco of Illinois Institute of Technology stated in a paper presented to the American Mathematical Society in New York.

Concentric circles of a sphere cannot accurately be represented by concentric circles in a plane, the mathematicians pointed out. No single map can be used to exactly represent the surface of a sphere.

"A map is not a perfect picture, but at best a systematic caricature," Prof. Kasner stated. "Various types of maps are faithful with respect to angles or areas or geodesics or loxodromes, but not to all of them. In the Mercator projection, the scale varies from latitude to latitude. In a general conformal map, where the angles are correct, the scale varies from point to point, and therefore is a function of the latitude and longitude."

One of the most famous conformal maps is the stereographic projection, known to Ptolemy during the second century, where angles are correctly represented. Another is the Mercator projection, where the regions around the poles are greatly exaggerated since the longitude and latitude lines meet each other at right angles. The Ptolemy and Mercator maps, together with the Lambert map, are the only possible maps whose scale curves are straight or circular.

When mapping is not conformal the scale depends not only upon the point itself, but also upon the direction.

Among the famous non-conformal maps are azimuth equidistant projection and azimuth equi-area projection, used extensively in recent air-ways literature. For each of these, the scale varies in a complicated manner which cannot usually be shown on a map, but can only be described analytically.

"In all conformal maps, the scale curves form a simple-infinite family, depending on one parameter; but in all non-conformal maps, the scale curves form a double-infinite family, since they depend on two parameters," Prof. Kasner stated. These new curve families have interesting geometric properties, which may be useful in practice.

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METALLURGY

Electroplating Units Perform Two Processes

➤ BOTH TIN plate and zinc-coated steel sheets are produced interchangeably on the same electroplating lines in a new precision unit of the Weirton Steel Company, Weirton, W. Va. Three lines of electrically operated equipment, each 400 feet long, turn out electrolytic zinc-coated sheets at the rate of 160 feet a minute. The equipment is the type developed recently for tin-plating that has revolutionized the production of this widely used war and civilian material.

For zinc coating a bath is made with zinc chloride, sodium chloride and aluminum chloride. The electric current carries zinc from pure zinc fixed terminals and deposits it on the moving metal sheets. Low-voltage generators deliver 60,000 amperes of power to the plating unit at all times while in use.

Tests of the product show, it is claimed, that there is a much tighter bond between the zinc and the steel plate than can be obtained by the older hot-dip method.

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ORDNANCE

Chinese General Patents Improved Gun Carriage

➤ INVENTION of an improved field-gun carriage that enables the gun crew to get their weapon into action more quickly, yet with less labor, has won U. S. patent 2,344,252 for a high-ranking Chinese officer now on duty in Washington, Maj. Gen. Piao Kiang, of the Office of Combined Chiefs of Staff.

Modern light field pieces and anti-tank guns no longer fire with their wheels resting on the ground. Instead, a base plate, as nearly as possible directly under the gun's center of gravity, is thrust against the ground by a jack, until the wheels are lifted clear. With the ends of the split trail, spread out to the rear, this forms a solid, stable tripod.

A drawback of the present system, however, is the time and labor involved in manipulating the jack and lifting the considerable weight of the gun, even a few inches.

General Kiang obviates this difficulty by having the spindles on which the wheels are mounted made integral with the front ends of the trail sections, at such an angle that when the latter are swung into firing position the wheels are moved obliquely forward and upward. At the same time, an ingenious arrangement of levers and cam surfaces swings the base plate downward into contact with the ground and causes it to support the weight of the gun.

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AERONAUTICS

Counter-Rotating Plane Supercharger Invented

➤ A SUPERCHARGER for engines of high-flying planes, made more efficient by having two sets of turbine-like blades rotating against each other in opposite directions, is the subject of patent 2,344,366, issued to Nathan C. Price of Hollywood, Calif. The increased efficiency of this counter-rotating supercharger, the inventor states, permits more compact construction, lighter weight and lower operating speeds. Patent rights are assigned to the Lockheed Aircraft Corporation.

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CE FIELDS

AGRICULTURE

Mountains of Peanuts Mean Oil, Stock Feed

See Front Cover

➤ PEANUTS enough to wallow in would represent Paradise on earth to many a small boy. The one pictured on the cover of this SCIENCE NEWS LETTER, however, seems to be taking his unique privilege calmly enough. That is probably because he is a Floridian; they raise peanuts to feed to the pigs in that fortunate state.

Little is wasted about the peanut plant, in the southern areas where it is grown on a large scale. The stalks are dried for hay, and since peanuts are legumes it makes a very nutritious, high-nitrogen hay. Oil pressed from the seeds is one of our best food oils, and plays several important roles in industry as well. This is doubly the case since the war deprived us of the larger part of the coconut oil that used to come from the Philippines and other tropical lands, necessitating replacements with domestically grown vegetable oils.

Finally, the press-cake left after the oil has been extracted is a valuable concentrated food for cattle, and with proper treatment makes a good material for the protein enrichment of other foods.

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ENGINEERING

Telephone Toll Calls Handled Automatically

➤ TELEPHONE toll and long distance calls are now handled automatically by an apparatus that forms part of a switching system used by the Bell System in a new toll office in Philadelphia. The user places his call with the long distance operator as usual, and the operator dials directly the called number in the distant town or city.

Another new development, known as automatic ticketing, is in use in a suburban office in the Los Angeles area. With this system subscribers in metropolitan areas will be able to dial directly most of their calls to nearby points, and the equipment will automatically prepare a printed ticket for each call, showing all information needed for charging the call to the proper subscriber.

These are two of the outstanding additions to the automatic or dial switching now in use with two-thirds of the Bell System telephones throughout the country. These installations were made in 1943 in spite of war conditions, and will be followed by further installations.

Post-war expansion of the telephone system now planned, including the installations of these new automatic toll devices and improvements suspended because of the war, will require many millions of dollars and give employment to thousands of men. Equipment manufacturers will also have a part in the program. The Western Electric Company makes much of the telephone equipment for the Bell System companies; before it can resume the production of telephone apparatus, reconversion of its plants, now used in manufacturing special war products, will be necessary.

Another telephone development which will be extended after the war is the expansion of the coaxial cable system. These cables are capable of carrying several hundred telephone conversations at the same time. They consist of two tubes, little larger than lead pencils, with a copper wire in each extending along its axis. They will probably play an important part in post-war television.

Science News Letter, March 25, 1944

PHYSICS

Italian's Novel Machine Converts Motion to Heat

➤ A CURIOUS reversal of the customary heat-to-motion relationship is represented in patent 2,344,075, granted to Alessandro Beldimano of Rome, and now vested in the Alien Property Custodian.

Most of our machinery is concerned with some part of the cycle of the conversion of heat into mechanical energy, or motion, as in the steam turbine or the internal combustion engine. Perhaps influenced by his country's poverty in fuel, Signor Beldimano has devised a simple engine for converting motion into heat. Essentially it is simply a device for stirring a liquid with paddles, rotating in a cylinder, briskly enough to warm it up. The needed mechanical energy, he suggests, can be obtained directly from a windmill. Thus the same wind that has chilled you out-or-doors may be put to work to warm you once you come into the house.

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ENGINEERING

Zero Octane Gasoline May Operate Future Autos

➤ ZERO OCTANE gasoline, not the much discussed 100-octane aviation fuel, may be used in the future to power the family car. This possibility is advanced by Dr. Carlton H. Schlesman, head of the research laboratories of the Socony-Vacuum Oil Company. He states a "most radical power plant" is already under development which makes use of radiant energy from low-grade fuels.

In this new engine, he said, "Fuel of low or even zero octane number is burned inside a gas mantel. Radiant energy is thus produced at high efficiency. This energy impinges on photo-electric cells which convert it into electrical energy. Such energy drives small electric motors mounted at the wheels."

The necessary light-weight, high-powered electric motor, up to now the missing link in the evolution of this new power system, has been developed and is available for use. Dr. Schlesman claims the new power plant will provide "unbelievable economy."

Science News Letter, March 25, 1944

PLANT PATHOLOGY

Daisies Now Blamed For Potato Disease

➤ DAISIES carry the virus that causes the yellow-dwarf disease of potatoes, according to studies conducted at the Cornell University Agricultural Experiment Station. Formerly, clovers were considered the source of the virus.

Daisies and a few other weeds actually carry the disease, and the virus is spread to potato plants by the clover leafhopper when the insects move to green potato fields from adjoining abandoned fields or meadows, Dr. S. G. Younkin found. Movement is usually in dry weather or after hay has been cut.

About 45 per cent of the daisy plants in the test fields carried the virus, while only three per cent of any other weed was found infected with yellow dwarf. Only one clover plant in the test plots was found infected.

The disease causes severe crop losses if tubers from infected potato plants are used for seed the following year. Reduction of the disease calls for control of the daisies and other perennial weeds on farmlands. Resistant varieties of potatoes, too, can be grown.

Science News Letter, March 25, 1944